THE IRON AGE

New York, July 4, 1918

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421

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NATION WIDE STEEL-SERVICE

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THE IRON AGE

New York, July 4, 1918

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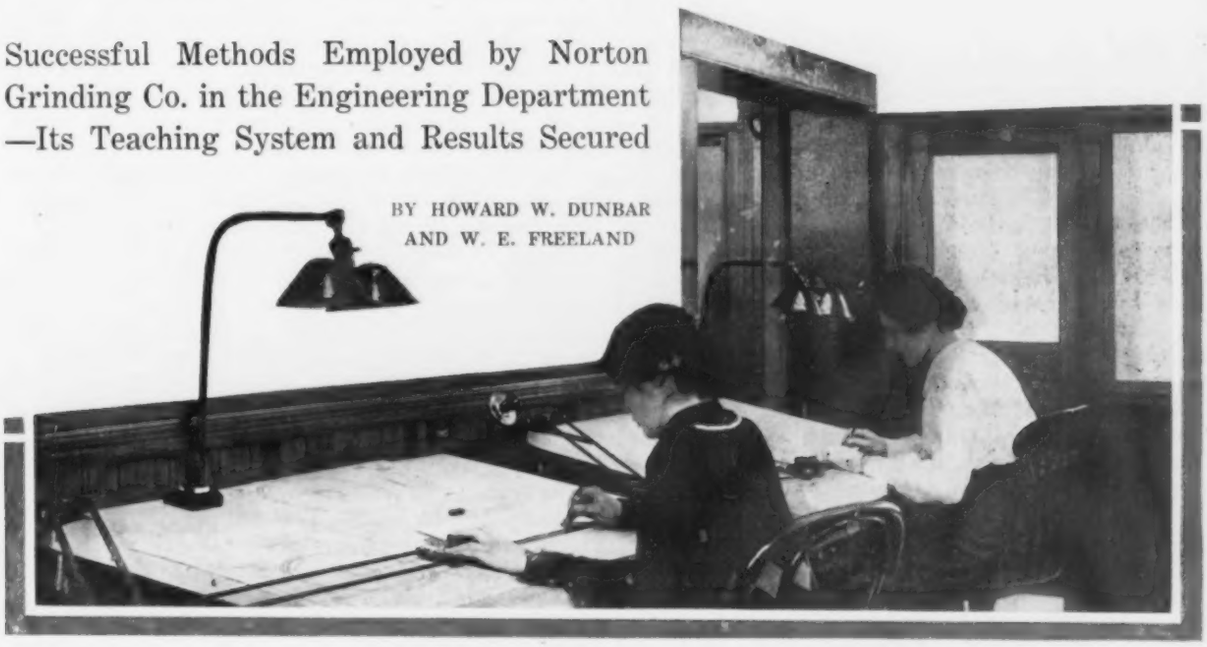
Training Women for the Drawing Room

Successful Methods Employed by Norton Grinding Co. in the Engineering Department —Its Teaching System and Results Secured

BY HOWARD W. DUNBAR
AND W. E. FREELAND



MUCH has been written of late of the employment of women in the war industries. One of the fields in which they have been peculiarly successful has been that of the drawing room of engineering departments and in other capacities in the technical side of industry. A notable success in such employment of women has been attained by the Norton Grinding Co., Worcester, Mass., manufacturer of precision grinding machinery.

The development of its system has been in progress for a little more than a year. In this period the company has trained approximately thirty women. Twelve of them have been trained in the tracing and detailing sections and the remainder in the vault and blueprinting sections. The women engaged for tracing work are of a higher grade than the women hired for the other two branches of the work, but women in each branch are assured that, if they possess possibilities for development they are to have the first opportunity in the work that they may desire to do in preference to new women employees. The blueprint worker may aspire to a position in the vault supervision section; the vault supervision girl may aspire to a tracing position; and the tracer who is capable of development may grow into a detailer. In rare instances those capable of making assembly drawings from details are given a chance to learn that more advanced work. Two of the women who have been trained in the last year are now making assembly drawings. One of these has been very successful in making patent drawings with but little assistance.

The women employed to do tracing work are carefully selected. It is not essential that they should have an extensive school education if they are bright, apt and intelligent. It is more important that they be of good character and have high moral standards in order that the sections having women employees shall not suffer from class distinctions or class feelings. It has been found that applicants that have had previous training in the high schools on drawing work are not so good as the average intelligent woman who has not had such training. The reason for this is not quite clear, but it is probably due to the fact that girls or, as a matter of fact, anyone who has had some instruction feel that they are quite well versed in the subject and are not disposed to follow closely the instructions or to learn the work as it is desired to teach it to them. In other words, they have ideas of their own of which it is difficult for them to rid themselves. Then again the instruction of the public school is arranged for a general, broad knowledge of the subject that is rarely applicable to a particular branch or phase of the work that the students may engage in and it is evident that they are acquainted with the technical terms associated with drawing, but have very little ability to make a practical application of what they have learned. The ages of the applicants vary from 17 to 35 years.

The blueprinting section is conducted entirely with women help. The normal output of this section is 800,000 to 1,000,000 sq. in. of finished blueprint each week. This amount of blueprinting is handled by a forewoman and two girls. This

staff, besides doing the work of ordinary blueprinting, take care of all the other forms of reproduction work, such as photostats, Van Dykes, etc. The equipment of the blueprint section consists of one 45-in. continuous printing machine, one 60-in. continuous washing and drying machine, photostat machine, trimmers, washtrays, hangers, etc. The girls have a weekly basic rate for 44 hours of service. They are guaranteed their weekly rate, but they work on a piece-work system and average 20 to 50 per cent over their base rates.

The vault service is in charge of a man of mature years and his assistants are all women. Their duties are the usual duties of filing drawings, issuing drawings, making charges, ordering blueprints and checking them for number and quality as a record for the piece-work payments.

Women are employed as tracers with a definite understanding as to their duties and advancement. They are given to understand that they are not certain of success and must prove their ability before they can be recognized as a member of the department. They are first taken on with the understanding that they are to work for one month under competent instruction as a sort of probation period in which the supervising engineer can decide whether they are capable of development for actual work. In this period they have eight lesson sheets which they have to make over and over again until their work is satisfactory to the instructor. That they may feel a degree of contentment and that they may take care of their financial obligations they are paid a weekly rate of $8. In other words, the company is willing to pay $32 to develop a tracer or, in the words of the supervisor, "It is willing to gamble $32 that it can make a tracer of a girl in four weeks."

At the end of this probation period, or before, if it is possible, a decision is made as to the prospective usefulness of the student. If the decision is a negative one she leaves; if it is affirmative she is put on regular work at the normal rate for which inexperienced boy tracers can be hired in that locality. This remains her rate of pay for five months. At the end of five months she is advanced $1 a week, and at the end of six months more she receives $1 a week more. Further advancement in pay is based upon the ability she may develop to perform the work and the degree to which she demonstrates that she is capable of taking on new tasks and new responsibilities. The company purposes paying the women the same rate as would have to be paid to young men for corresponding service. As the company is desirous of advancing the women as fast as possible, those showing particular adaptability for drawing work and having somewhat of a mechanical instinct are developed into detailers and for layout work.

When a woman is engaged and during the instruction period of a month or less she is required to charge her time against an order which is issued at the time she is hired. This is done in order that records may be kept of the exact cost of each girl's instruction. Although a period of four weeks has been set as the limit of time in which a woman shall show her adaptability for the work, in the group that has been trained it has never been necessary to go to this limit of time and many have proved their ability to perform the desired tasks in three or four days.

Each woman student is furnished with an equipment complete for the work which she is to perform. It is believed that this is quite a factor in the successful conduct of a woman's section of a tracing division because when they are given only such instruments as are needed in their work they become proficient in the use of those instruments and are not confused by having a complete set of drafting implements with many of which they are not sufficiently acquainted to make proper use. As the company furnishes the instruments, it is assured that they are high grade, are all just alike, and that one girl has no advantage over another in the tools she uses. So the common excuse that "If I had such and such instruments like the other girl has I could do better work" is not heard.

The Universal drafting machine is used in the entire department, this applying to women tracers as well as the regular draftsmen, and therefore the instructors are not confronted with the problem of teaching the use of the T square, parallel ruler and other instruments. This also eliminates the triangle and scales and the equipment is reduced to a very small number of instruments which the women must master.

Lesson sheets for the tracers are planned with the idea of providing proper instruction along the lines most difficult for the women to acquire. It is a recognized fact that the most difficult thing for a young woman to do in connection with drafting work is to make good, freehand letters. Therefore, this subject is taken up in the first lesson because if the student cannot master lettering sufficiently well to make a drawing appear neat it is virtually a sure sign that she will not make a successful tracer. Much thought has been given to the preparation of the text and the sequence of these lesson sheets.

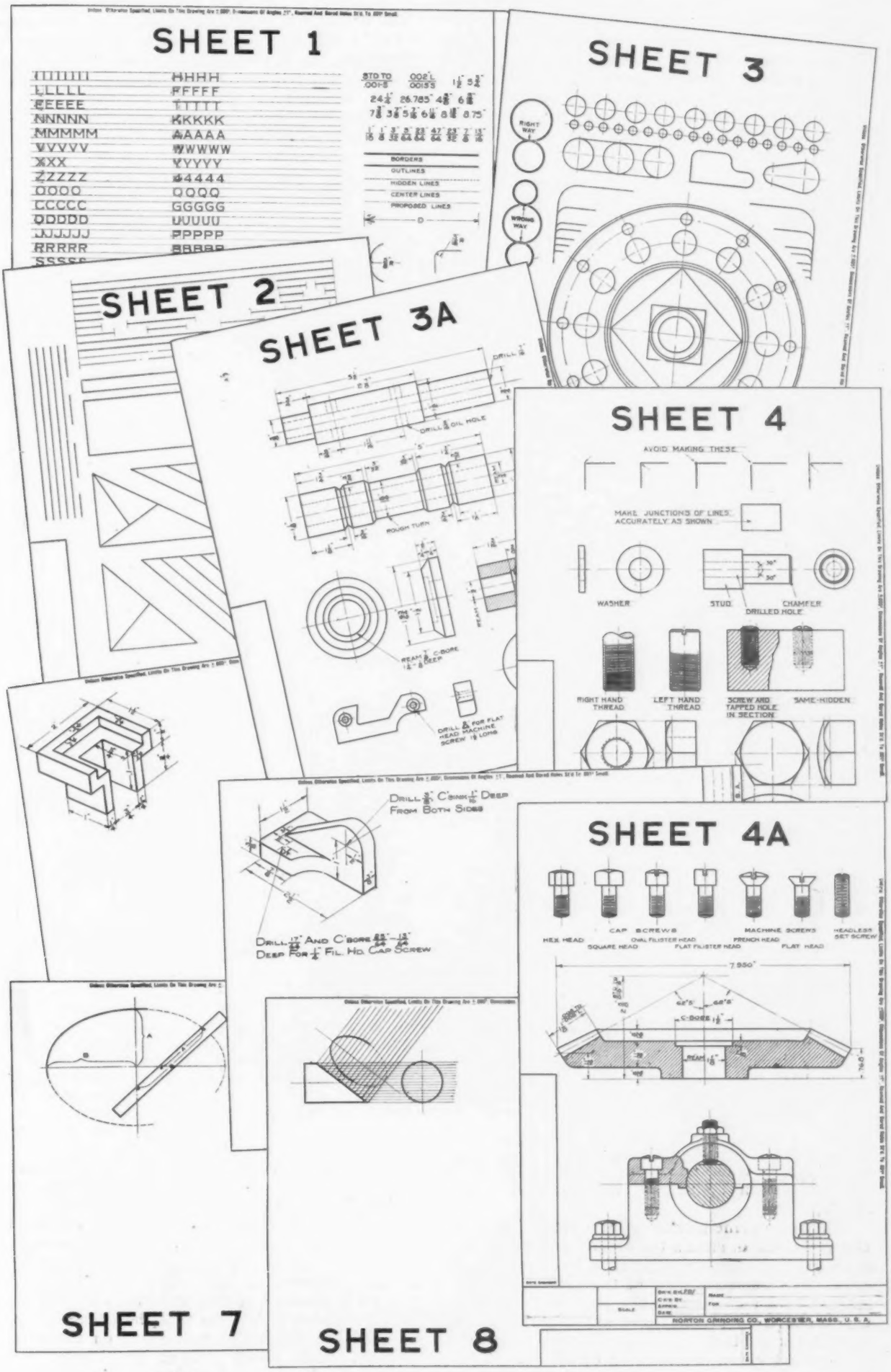
Referring to Lesson 1, it will be seen that the teaching of lettering starts with the simplest lines or combination of lines to make the ordinary capital Gothic letters. First are the vertical lines, a combination of vertical and horizontal, then a combination of vertical and oblique, and so on down to the letters having curves and irregular shapes.

These lesson sheets are prepared by taking the original sheet and making a photostat so as to produce a faint black print on a white background. In all of these sheets the student is required first to trace over the characters produced by this printing process and in the case of the lettering sheets to continue to fill out the blank space in each line as best she can.

These lesson sheets are of the same form as the regular drawing sheets with standard title border. This is done with object of requiring the student to fill in the descriptive spaces as she would have to do on regular drawings. She is obliged while a student to put in these spaces words that indicate the use she will make of these spaces in actual work.

On the second lesson sheet the student is taught to use the drafting machine and other instruments. As in the first lesson this sheet starts with simple operations. The student draws directly over the lines appearing on the photostat lesson sheet.

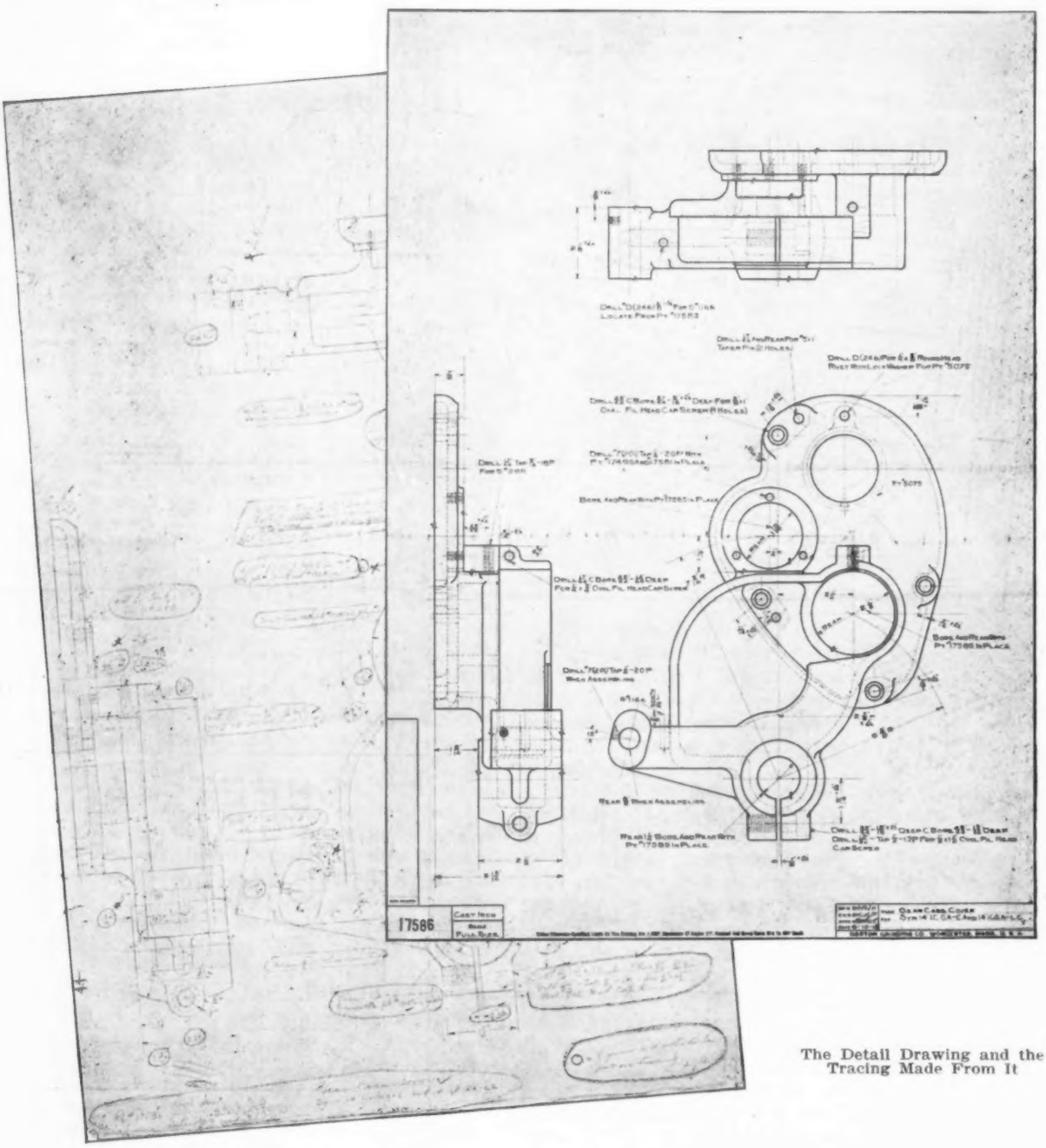
On lesson sheet No. 3 it will be observed that the student makes a still further advance by drawing conventional figures in combinations of straight and curved lines. In making these drawings particular attention is given to the joining of the lines without overlapping and so that they are clean cut, not blurred or blotted. The fourth lesson is but a step from the conventional drawing to actual pictures of parts as the student will see them in the tracing work. There also is given the



Lesson Sheets of Norton Standard Size and System of Drawing Are Reproduced by a Faint Photostat Print for Tracing in the Probation and Educational Period

lettering that will appear on the regular drawings.

After the student has mastered the first four lessons further advanced work is given her on lesson sheets numbered 1A, 2A, 3A, and 4A. Sheet No. 1A is simply an advanced sheet of Lesson No. 1, which covers the study of lettering, but the letters appear in word combinations and these words are those which the student will use in her actual work later in tracing drawings. This same principle has been applied in the other advanced sheets.



The Detail Drawing and the Tracing Made From It

The same principles have been applied in compiling the lesson sheets for detailers. The student is taught to go from simple forms to more difficult ones. The isometric view of the pieces gives the student in a general way the picture of the part which she is to produce and furnishes sufficient dimensions so that she can correctly draw the three usual views of standard drawings. It has been particularly interesting to see how well, step by step, the lesson sheets bring the student from simple things to more difficult pieces and finally to the most difficult of parts, including coring, blind drilled and tapped holes, etc., and how naturally by this process of meeting ever-increasing difficulties the student improves and becomes accustomed to the class of drawing that she is actually to work on.

When the detail drawings are made up they are complete in every essential; that is they have the limits established and all the notes written. These notes and other detailed information are put on the drawing in good legible writing. The girls who are to do the tracing have acquired all the training necessary to enable them to make the letters and figures neatly. Therefore, when the tracing is finished all that it is necessary to do is to have it checked by the one in charge of the tracing division to be sure that the tracer has reproduced the detail that was given on the detail drawing, such detail having previously been checked for its mechanical features in regard to limits, material, design, shape, proportions, etc. From the beginning of their training the stu-

dents work on sheets which are of standard size, 10 x 14 in.

Summary of a Year's Experience

The training division is in charge of a man competent by experience and temperament for this special task. The success of such work rests largely in the selection of the man to take charge of it. One must be secured who is competent to direct the girls and, further, can appreciate their little peculiarities and tactfully give instruction and criticism so as to gain their confidence. It has been determined, too, that another important feature in the successful conduct of such a division of women workers is to place them in a separate room so that there will be little occasion for them to intermingle with the draftsmen. Reference has been made to the necessity for careful selection of the students and too much emphasis cannot be placed upon the statement that experience dictates that those who have not had previous training learn more rapidly and thoroughly than those who have had some idea of the work and have well-fixed conceptions of what they can and cannot do. Experience, too, dictates that there is little opportunity for group instruction as each woman student must be studied and treated individually to secure the best results.

The work has not been in progress long enough to determine what will be the full measure of success, but a very large measure of success has already been attained. How some of the girls have proved capable of advancement beyond mere tracing work has already been told earlier in this article. Others are showing similar possibilities.

The adaptability of women to this work is particularly well shown by some figures of the cost of training. Of the girls who have taken up tracing study there has been but one who failed. The cost of training the first five girls were respectively $8.16, $7.35, $6.22, $7.55 and $11.92. The women who have taken up the training since then have cost approximately the same amounts.

In the employment of young men for blueprinting, vault service and tracing, there is always one great problem. The young man looks upon his work in these divisions merely as a probation period which he must serve as a penalty for eventually becoming a draftsman. He does not consider that this work is experience in his future line and that it is giving him a training which will later fit him for a higher position. Contrary to this general feeling among young men, young women are pleased to have an opportunity to go into these branches of work. Perhaps this is because women have a certain pride in being able to accomplish work which tradition has said should be performed by young men. They are content to remain on their job long after they have mastered it, whereas a young man is always looking for something new. The women are steady in their attendance, dutiful to their employer and patient to an unbelievable extent. Unpleasantness is rarely experienced in dealing with a girl tracer, even though you may ask her to redraw the same drawing a dozen times, whereas in the case of a young man, if you ask for a single line to be changed on the drawing there is generally an excuse or complaint forthcoming. A woman is very reluctant to allow work to leave her drawing board if she knows there is a mistake or error in it, whereas a young man is constantly trying to slip mistakes and errors through because he does not like to make the changes. Neatness is the natural characteristic of a girl and where her ability has been properly trained her drawings will be found to be neat, painstaking and in good order.

A Call for Employment Managers

The Emergency Fleet Corporation, Philadelphia, is desirous of recruiting employment managers, assistant employment managers and interviewers for shipyard employment work. Readers are requested to give the subjoined statement of qualifications their consideration and either to send the names of likely candidates to the acting head of the industrial service section of the corporation, C. W. Doten, or refer the matter to those acquaintances who seem likely to be interested.

Briefly outlined, the Emergency Fleet Corporation is interested in securing men of an industrial experience closely allied to shipyard work, who after taking a six weeks' course for employment managers, being given at little or no expense at such universities as Rochester University, Harvard University and Columbia University, in the fundamentals of employment managers, will be in a position to render valuable service in shipyard work in the capacity of employment managers, or as assistant employment managers. It is emphasized that the men should be of good appearance and address, general intelligence, tact, of other qualifications calculated to make them of immediate value as employment men.

The corporation is also interested in securing men of industrial experience closely allied to the shipbuilding trades and capable of entering employment departments of the shipyards as interviewers for selecting skilled shipyard help. These men would, it is explained, be more of the individual type of workers than those referred to as prospective employment managers.

A fire on June 22 damaged the offices of the Medart Patent Pulley Co., St. Louis, but the plant is in operation turning out its production as usual. Newspaper reports that the plant was destroyed were entirely erroneous.

Indianapolis Companies Merged

The Lyons-Atlas Co., Indianapolis, manufacturer of Diesel and oil engines and other machinery, and the Hill Pump Co., Anderson, Ind., have been merged in a new organization, the Midwest Engine Co., capitalized at $3,500,000. The Lyons-Atlas Co. has about 1800 employees, and the Hill company 800. The latter manufactures turbine engines and pumps. Stoughton A. Fletcher, president of the Fletcher-American National Bank, Indianapolis, has a controlling interest in the new organization. He states that $1,000,000 will be spent at once for plant extension and equipment. It is understood that the Anderson company had Government orders considerably beyond its capacity and the Indianapolis company had a capacity in excess of its bookings. Orders for turbine engines to the amount of $6,000,000 are in hand. The value of the output of the new company, when extensions are completed, is estimated at $20,000,000 annually, and it is expected 5000 men will be employed. The Lyons-Atlas Co. occupies a tract of 65 acres at Nineteenth Street and Martindale Avenue, Indianapolis, of which 35 acres are under roof in 20 buildings with 600,000 sq. ft. of floor space. The plant is made up of two units. The Hill company occupies one large building at Anderson covering a city square.

The officers of the new organization are: John G. Wood, Anderson, president and general manager; Harry W. Griffin, Detroit, secretary-treasurer; O. C. Pantall, Indianapolis, vice-president. Mr. Wood was formerly general manager of the Remy electric division of the United Motors Corporation, and Mr. Griffin was general sales manager of the Remy company. They both resigned these positions to accept places with the Midwest company. Fred S. Robinson, assistant to the former president of the Lyons-Atlas Co., will probably be manager of the Indianapolis plant.

A Priority System for Labor Recruiting

Preferential Industries to Be Taken Care Of, Possibly by Draft Exemptions — Washington Cautious in Dealing with Labor Shifting Problem

WASHINGTON, July 2.—The War Industries Board is seriously contemplating two important steps with respect to the labor supply of the industries essential to the conduct of the war. The first of these is the creation of a system of priority under which industries contributing directly to the conduct of the war will be preferred. The second and most radical step, and one which will be taken only after the most careful deliberation, involves the exemption from military service of practically all the labor required by those industries engaged in certain absolutely essential work. The survey of the common labor of the country to be used as the basis for an exclusive system of allocation to the industries, which has been begun by the United States Employment Service, bears an important relation to the project now being considered by the War Industries Board, and the employment service will have an important part in working out the plan finally adopted.

Increased Demands for Shipbuilding

The necessity for action by the War Industries Board with reference to an adequate supply of labor for the essential industries has been greatly emphasized of late by the results of the canvass for ship workers which has been carried on under the general direction of the Emergency Fleet Corporation. The enterprising methods pursued in recruiting all trades for shipbuilding, together with practical exemption from military service, has enabled the leading shipyards to draw labor, both skilled and unskilled, from all other industries, and the high wage scale now in force, taken in connection with the standardization recently completed for the shipyards of the Atlantic and Gulf coasts, has cut down the labor turnover to a marked degree. At present, therefore, all industries are sacrificing men to the shipyards and there is no reciprocal shifting of ship workers to other trades. This fact gives special point to statements made before committees of the Senate in the past week by Chairman Hurley and other Shipping Board officials to the effect that while the shipyards are now employing upwards of 350,000 men it is hoped that within a few months it will be practicable to increase the number to 600,000. With such a draft on the other industries in prospect, the members of the War Industries Board are naturally deeply concerned regarding the situation and are seriously considering the steps that should be taken for the protection of other industries.

From a war standpoint the industries which must be safeguarded with special care are coal-mining, steelmaking in all its stages from the manufacture of coke to the most highly finished products in the category of war material, and the railroads. In considering the possibilities of the application of protective methods to these industries, the manufacturers engaged in steel production must face the fact that coal-mining is under the supervision of the powerful governmental agency known as the Fuel Administration, while the interests of the railroads are being very vigilantly looked after by the Railroad Administration. While, therefore, it may be assumed that the Ordnance Bureau of the War Department, for example, would be thoroughly alive to the necessity of maintaining an adequate supply of labor for all factories engaged in turning out munitions of all kinds, it is obvious that a high degree of coordination would be necessary to secure full protection for all manufacturers engaged on work for other bureaus of that department and for the Navy.

The Virtual Commandeering for Government Shops

The shifting of labor from non-essential to essential work will probably be undertaken by the Government on a more or less comprehensive scale before steps are taken to increase the draft exemptions to include other industries than shipbuilding. Already some progress has been made in this direction through the more or less arbitrary commandeering of workmen for Government establishments. Beginning early in the present year, skilled workers and common laborers have been taken from their private employment by labor commissioners representing governmental manufacturing establishments and, while there was no specific authority for such action in the standing regulations, few protests have been received here. In nearly all cases the men were given higher pay in their new employment, usually coupled with shorter hours, and as the manufacturers losing the labor have taken a philosophical view of the matter no issue has been made here of the fairness of the action. As to its legality nearly every intelligent person is doubtless by this time fully aware of the comprehensive authority that may be wielded by the Government under the general war powers with which Congress has clothed the executive departments.

The prospect that labor is soon to be shifted on a large scale to speed up the production of war materials has again raised the specter which the Administration has been at such pains to down, namely, the necessity of drawing a sharp line of demarcation between so-called essential and non-essential industries and the definite listing of the latter class. It can be stated on the highest authority that, although the officials here recognize the difficulty of meeting the situation without specifying the non-essential industries, it has not yet been decided to publish a hard and fast category thereof. Rumors that such a list would soon appear have been current for many weeks but they have been categorically denied by such authorities as Chairman Baruch of the War Industries Board, Fuel Administrator Garfield, and others. These officials still hope that it will be possible to handle the problem by approaching it from the angle heretofore employed by the Fuel Administration and the Priorities Committee of the War Industries Board, which have granted preferences to the war industries with reference to their relative importance, but have refrained from listing any particular line of enterprise as non-essential. Even in the negotiation of such agreements as have been made by Dr. Garfield involving curtailment of coal supply the Fuel Administrator has been careful to point out that the industries affected were "non-war" industries rather than non-essential. This statement has applied to cuts in coal supply voluntarily agreed to by manufacturers of window glass, lime, box-board, and even to the less voluntary adjustment reached with the Fuel Administration by the manufacturers of pleasure automobiles.

Official Preference List in Shifting Labor

Whether it proves necessary to promulgate a list of non-essential industries or not the shifting of labor on the basis of relative priority will soon begin on a large scale. The War Industries Board will assume general responsibility in the matter and will doubtless employ as its agencies both the Priorities Committee and the United States Employment Service. There is already in existence an official preference list, recently published in THE IRON AGE, and this, with such modifications as may be made from time to time, will serve as a guide in indicating the industries that are to receive help in maintaining an adequate labor supply. In the opinion of members of the War Industries Board it would seem to be quite practicable to operate a labor priority scheme on the basis of this preference list without specifically indicating the non-essential indus-

tries. The distribution of coal is now made on the preference list and transportation for raw materials and finished products is being accorded on the same basis.

Should this plan be pursued the agents of the Employment Service, instead of taking labor from industries listed as non-essential, would be at liberty to transfer it from any establishment not definitely protected by the preference schedule. What the manufacturers engaged in industries that do not contribute directly to the conduct of the war especially dread is being included in a definite published category designed to make them the victims of every preferential project of the Government. Such designation would, of course, involve them in serious financial complications, injure or destroy their bank credits, demoralize their organizations, and in many cases result in absolute ruin.

Caution About Granting Draft Exemption

In approaching the question of granting draft exemptions to the men employed in coal-mining, railroad work and steel production, the members of the War Industries Board realize that they are treading on dangerous ground and they are, therefore, proceeding with great caution. The actual granting of such exemptions would have to be made by the Provost Marshal General, but this fact does not threaten a serious complication for the reason that a direction from the President would be sufficient to produce the necessary order and there is no doubt in the minds of those who are familiar with the situation here that the President will give the necessary instructions whenever he receives a specific recommendation to do so from Chairman Baruch of the War Industries Board. The cutting of red tape is Mr. Baruch's specialty, and the confidence reposed in his judgment by the President is almost unlimited. The problem, therefore, is after all a simple one, and action may come wholly without warning at an early date.

There is reason to believe that if draft exemptions are extended materially they will first be allowed in favor of the coal-mining industry. Notwithstanding the fact that the recent weekly reports of the U. S. Geological Survey show unprecedented production, the Fuel Administrator is still convinced that there will be a large shortage for the year beginning April 1, 1918, and that in spite of every effort at economy and curtailment the deficit cannot be forced below 60,000,000 tons. Increased production is possible provided mining labor is not further interfered with by the draft and provided also an adequate supply of cars is assured. The Railroad Administration is much gratified with the success that has attended the working out of recently devised plans for giving the coal mines 100 per cent of their needed transportation facilities and the Fuel Administration is in receipt of reports indicating that the coal miners in both anthracite and bituminous fields are doing less idling than heretofore and have agreed in large numbers to forego Saturday half holidays throughout the summer. The next draft call, however, is likely to make heavy inroads on both branches of the industry which, in some districts, is already suffering as the result of voluntary enlistments by many able-bodied young men.

Exemption Possible in Railroading and Coal Mining

Every reliable indication here points to the certainty that draft exemptions will be resorted to if necessary to keep the principal railroad systems of the country fully manned. The dependence of the entire ordnance program on steel, coal and transportation, not to mention the general welfare of the people at large, would fully justify the Administration, it is believed here, in taking any steps that may be necessary to keep the railroads running at full speed. Whether it will prove practicable to maintain the efficiency of all the leading systems on a mere priority basis remains to be seen, but experts here express serious doubts on this point. It is also a question as to whether it would be practicable to recruit desirable railroad labor among other industries to make up for losses to the draft and there can be no doubt that, aside from shop work, the efficiency of the railroads would be decreased by substituting engineers, firemen and other workers having no experience in railroad operation.

Labor for Steel Making to Be Made Available

It will be safe for the steel manufacturers to count upon material assistance from the Government's labor priority plans when they are fully worked out. As already indicated, the full protection of that part of the industry engaged in war work will be a complicated proposition, but it will not severely tax the ingenuity of the authorities, and so far as the more essential features of the industry are concerned it will be a comparatively simple matter to provide all desired labor. The Government is now giving special attention to increasing the coke supply and will provide every worker needed in this connection. The blast furnace situation will receive adequate attention and the United States Employment Service has been at work for some time in the interest of all the establishments receiving Government aid in the production of ordnance.

If the current volume of output were sufficient to meet the necessities of the Government it would not be necessary to resort to draft exemptions, in the opinion of the authorities here, but production in nearly every establishment is below the desired peak and old plants are being extended and new ones created in several important districts. It has even been found impossible to strictly observe the restrictions of the so-called "red flag" zone. Quantity production has not yet been attained in the big gun program and the maximum output of heavy ordnance will not be reached before the end of the present year. The labor demands of nearly all concerns working on heavy ordnance are steadily increasing, and it is a serious question whether any mere priority project will take care of the situation as it will exist six months hence, complicated as it will then be by voluntary enlistments and draft calls. W. L. C.

To Rehabilitate the Wounded for Civil Pursuits

Congress, without dissenting vote, has delegated to the Federal Board for Vocational Education the task of re-educating and rehabilitating for civil life and usefulness such of our wounded soldiers and sailors as may be proper subjects. Available statistics show the number to average about 10,000 per million men per annum. In other words, on the present army and navy strength, together with auxiliaries, we are certain of almost 30,000 men to be subjects for re-education this year. As the strength grows the number of men grows. With the more sanguinary nature of the fighting in open warfare instead of trench stalemate, the average may run to higher figures.

Experience of our allies shows that over 80 per cent of permanently disabled men can be re-educated for useful, self-sustaining, wage-earning employment. Many of them, it is expected, will be made into expert artisans and mechanics.

The capacity of the factories of Canada approximates 400,000 18-pounder shrapnel shells complete per week, including cartridge cases, primers, fuses and propellants, according to D. M. Metcalf, chief inspector of steam boilers at Toronto. He delivered an address before the American Boiler Manufacturers Association at Philadelphia on June 18. In addition to this output he says there is a capacity in Canada for almost 400,000 high-explosive shells, ranging in sizes from 18-pounders to 9.2-in., making a weekly total of about 800,000 shells, and absorbing in their manufacture approximately 25,000 tons of steel. The value of orders for munitions last year approached $800,000,000, and the value of munitions shipped to date is close to $600,000,000.

After undergoing extensive repairs No. 2 blast furnace of the Steelton, Pa., plant of the Bethlehem Steel Corporation was placed into operation last week. It had been idle for six months.

Lot Cost System in Making Winchester Guns

Bonus Payments to Machine Adjusters and Instructors a Feature of Production System—Some of the Cost Forms Used

BY W. E. FREELAND

AN important part of the work in a gun and cartridge plant of the Winchester Repeating Arms Co. is that of the adjusters, who keep the machines in working order to maintain the perfection of the parts produced and also act as instructors to the operatives of the machines. The machine adjusters receive a bonus. An adjuster whose base rate per hour is a and who has charge over n machines is considered as having a base rate per machine equal to $a \div n$. Whenever one of his machine operators produces the task number of pieces per hour, the adjuster is paid a bonus piece of one-third of the base rate, or $a \div 3nN$ per piece. This bonus thus becomes proportionately greater if the operator turns out more than N pieces per hour.

If the operator turns out less than N pieces, a bonus of five-sixths of the above piece bonus, or $5a \div 18nN$, is paid to the adjuster until the production drops to 5/6 N pieces. Below this amount the bonus ceases altogether. For example, an adjuster whose base rate is 36 cents per hour has charge of 12 automatic milling machines. The task production on these machines is 107 pieces per hour. When production reaches 110 pieces per hour the adjuster's bonus becomes:

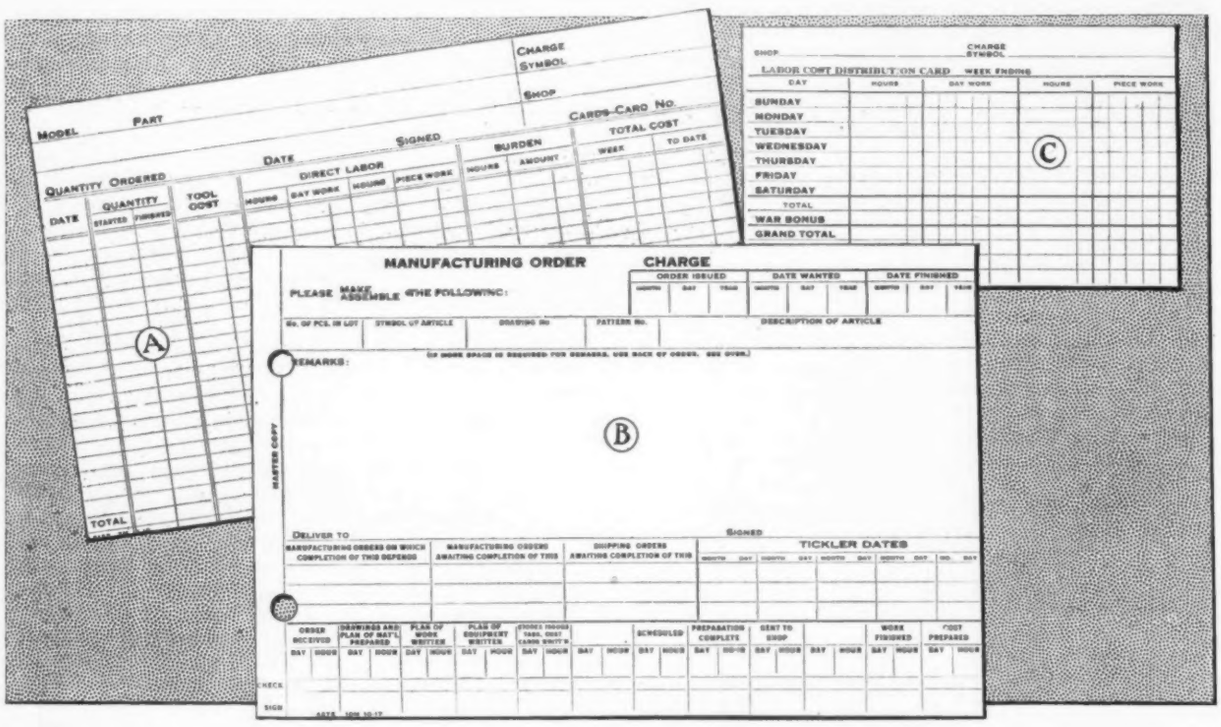
$$\frac{110a}{3nN} = \frac{110 \times 36}{3 \times 12 \times 107} = 1.028$$

Hence the total bonus per hour is 1.028c.

The best men are naturally given the full number of machines that it is determined that a competent adjuster can maintain at full productive capacity. In exceptional cases an adjuster may be given even more than his number, but the less competent are given a smaller number of machines. One machine may be more difficult to keep up than another. To overcome this the rate is based on a less number of machines. The machines an adjuster looks after need not necessarily all be based the same. Where the less competent adjusters are not given a full complement of machines, they lose nothing because their day rate is guaranteed. For each machine an adjuster looks after, he has a time operation ticket showing production corresponding to that of the operator. In other words, an adjuster has his regular day work ticket and a ticket for each machine he looks after.

Production orders for guns are issued by the planning department in lots and the costs are gathered upon each production lot. An individual cost collection card is maintained for each shop through which the work is routed. This shop cost card shows the number of parts received to be worked upon and the number of parts finished upon leaving the shop, showing in each shop the amount of work lost through the operation. This permits close investigation of shop losses through manufacture and also permits the display of the amount expended upon particular lots by shops. This scheme ties in with the general production control scheme of the plant and is an aid to production control as an added check with the dollar and cents value attached.

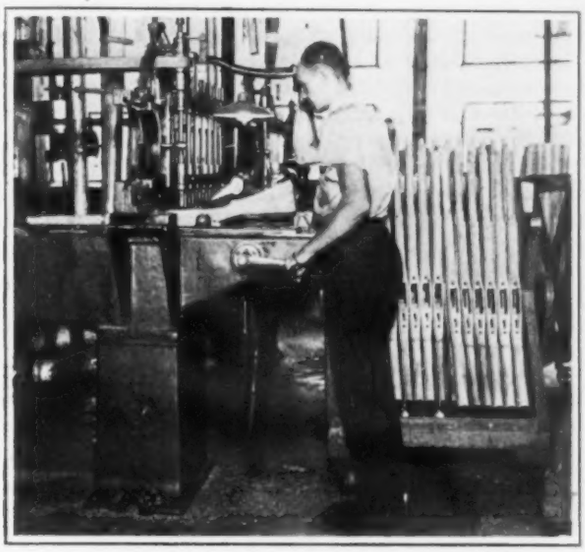
Distribution of pay rolls is by the same method as used in the cartridge shop, up to the point of posting to the shop cost card. In the gun depart-



Forms Used in Determining Cost of Gun Manufacture

ment work this posting is done in the cost department after the cost analysis cards have been checked with the payroll.

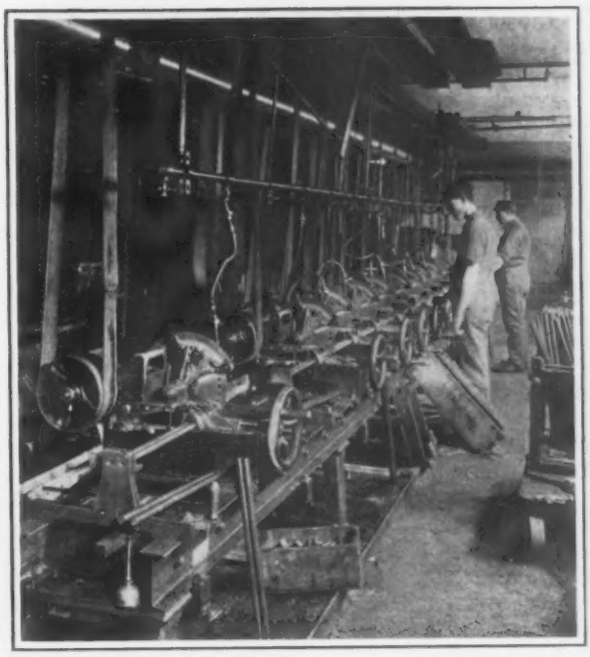
The particular feature, from the manufacturing viewpoint, in the gun lot cost system, is the charging of consumable production tools directly to the cost order in the same manner as materials and labor are charged instead of absorbing their cost in a burden charge. The production tools in the manufacture of a gun are one of the largest individual items of costs entering into such production. The lot system makes it possible to manufacture components, figure the costs on these components, and



As an Example of Highly Developed Machinery Employed Is This 6-Spindle In-Letter for Magazines in the Gun Stocks

turn them into stores when completed and ready for assembly at a specified cost per component. The components are later drawn from worked material stores and charged to an assembly lot order as materials, to which assembly lot order is added, of course, the direct labor of assembly and the burden charge.

The principal value of the lot cost system is the statistical feature that permits the comparison of costs between lots and the comparison of tool costs

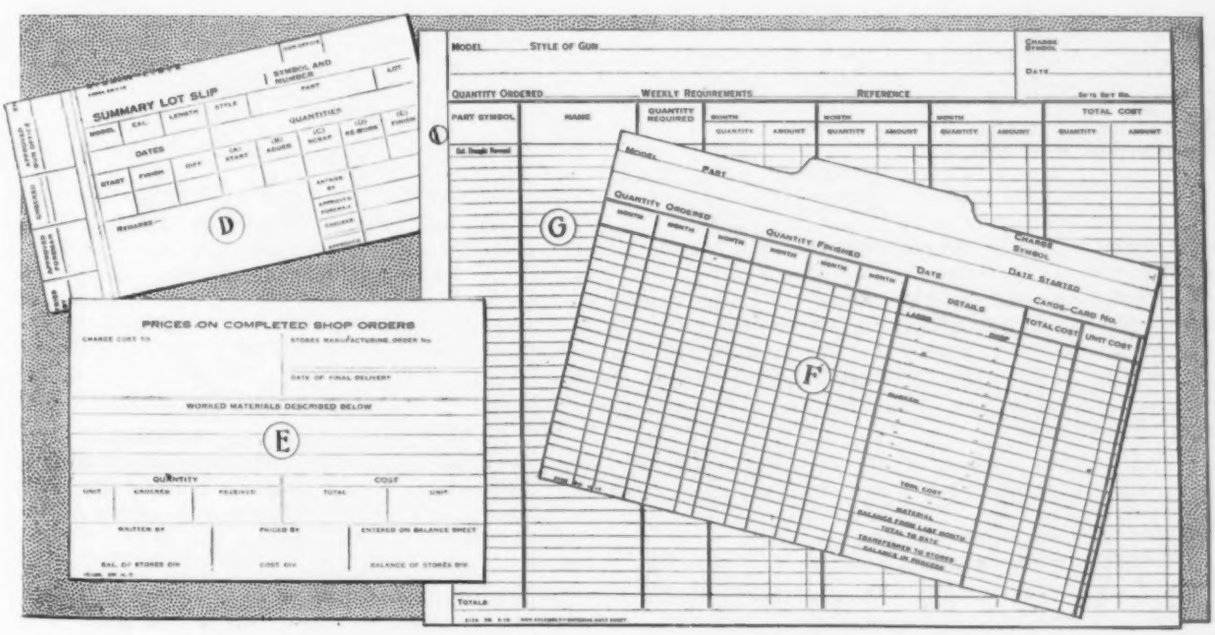


One of the First Operations in Gun Manufacture Is Cutting the Bar Stock Into Barrel Lengths

between lots at various times, in accordance with the condition of the factory as to activity; and further, there is the additional value that comes from showing the figures of the lot costs or tool costs to the foremen.

The gun department, in common with all other departments, uses product symbols in gathering costs. Each model of gun has been given a symbol and each part of the gun has also been given a symbol which identifies it as belonging to a certain model. All orders and plans of work of the gun department bear these symbols. When the planning section writes an order it assigns the gun symbol and order number. The planning section maintains one series of order numbers which it assigns to all orders serially, regardless of model or part.

One of the important forms used in gathering costs is the gun part process cost card, A. This card is written by the planning section when the manufacturing order is written and is forwarded



Forms Used in Determining Cost of Gun Manufacture

to the cost division. There is one gun part process cost card made out for each order for each part for each shop through which the part is routed. All labor charges against an order on the operation cards or time tickets in the various shops are summarized weekly on a labor distribution card, C, and these charges are broken down into piece work, day work and machine hours. All charges appearing on the labor distribution cards must balance with the shop payrolls and these cards and the payrolls are audited periodically and the accounts checked with the operation cards or time tickets. These labor distribution cards when properly audited are forwarded to the cost division where the charges are posted on the gun part process cost card.

All tools that are special to gun part manufacture and which are carried by drawing number from the gun production tool balance of stores record in the gun department office are drawn from stores on the regular stores issue slip and are charged to the production order for the part on which the tools are to be used. All tools of this nature are manufactured for stores and carried on the balance of stores record at full value. These tools are charged to a production order at full value when withdrawn from stores. Fixtures, gages and standard tools which are not carried on a balance of stores record are carried on a fixed inventory in the tool cages. When an order is completed, all unused tools charged to that order are returned to stores on regular stores credit tickets. All used tools are attached to the fixture and returned to the central tool cage without credit. Credits for unused tools are at full value.

When a requisition has been sent through the regular channels to the cost division, the value of the tools is posted on the gun part process cost card. Salvage from tools in the form of high-speed steel is credited to the shop expense account of the shop where the tools were used.

When a lot has been finished and the lot sheet audited by the lot auditor in the planning section, he signs a summary lot slip, D, and forwards it to the cost division. It shows the quantity started, the quantity finished and the loss due to defective manufacture and scrappage. The cost division enters the started and the finished quantity to show by the lot summary ticket on the gun part process cost cards, F. The burden for each shop is computed separately and applied monthly on the gun part process cost cards.

When the cost division receives the gun part process cost cards for a particular order it makes out a summary cost card and enters upon this form all the materials, either worked or raw, withdrawn from stores against the order and the quantity of finished work returned to stores as shown on the stores worked material receipt slip. The cost division also records on the cost summary card a summary of the monthly charges against the order by shops for labor and burden. Each month the gun part process cost card is totaled, the burden applied and the amount transferred to the summary cost card. The summary cost cards are collected by models and show the total investment on parts in process for each model. The cost of the various parts by orders is forwarded by the cost division on a special form, E, to the planning section of the gun department, where these prices are entered on the worked material balance of stores sheet. These costs are entered on requisitions for gun parts and always are the average value of the parts to date. Specification values are used by the planning section until actual values can be obtained.

The planning section makes a monthly report to the superintendent of the gun department, showing the worked material in process and the investment in it. When the planning section writes the order for the assembling of guns, it also prepares the gun assembly material cost sheets H. The cost division keeps on this sheet all records of gun parts withdrawn from stores for assembly. All labor and burden charges of the assembling shops are collected on the gun part process card. At the completion of the order the cost of material is transferred to cost summary sheet the same as used for cost of components and the cost of the guns can then be obtained.

Brass Manufacturers' Meeting

That about 75 per cent of the capacity of the brass manufacturing plants of the country is now engaged directly or indirectly on Government work was indicated by reports made at the quarterly meeting of the National Association of Brass Manufacturers held at the Hollenden Hotel, Cleveland, June 25 to 27. So much of the manufacturing facilities is now being used on Government work that it was stated that production of regular lines is not keeping up with the demand, and manufacturers are behind on deliveries. Members of the organization stated that never previously in the history of the industry were brass manufacturers confronted with the question of production.

The association decided that for the present it would allow on shipments of 125 lb. and over freight actually paid up to $1.50 per 100 lb. This is not a change from the policy that has prevailed and simply means that the manufacturers are willing to absorb the increased freight rate. The War Service Committee reported that it had filed a list of the plant equipment facilities of the various brass manufacturers with the proper departments in Washington with a view of having the Government make such use of their plants as it might require.

An important topic taken up during the meeting was trade extension. The association will conduct a campaign of publicity in order to educate house owners, plumbers and steam fitters to use better material and goods that bear the manufacturer's trade name and are guaranteed. One of the objects of this campaign is to help the industry by encouraging building owners to tear out old and unsanitary plumbing and replace it with modern equipment. This work would to a certain extent offset the loss of business resulting from the very limited activity in the building field at the present time because of war time conditions.

The next quarterly meeting will be held in Cleveland Sept. 18 and 19.

New Installation of Snyder Electric Furnace

The Industrial Electric Furnace Co., Chicago, maker of the Snyder electric furnace, is installing a 3-ton furnace in the new building of the Atlantic Foundry Co., Akron, Ohio. It is a 3-phase furnace built for acid operation on general steel casting work. Chas. Reyman is president and general manager of the Atlantic Foundry Co. and John Steckel, treasurer and purchasing agent.

The Aspromet Co., Pittsburgh, formerly the Asbestos Protected Metal Co., announces the removal of its Chicago office on July 1, to the Railway Exchange Building. J. T. O'Neill will continue in charge as district manager.

A contribution of $100,000 was made by the Bethlehem Steel Corporation to the war chest fund at Bethlehem, Pa. Charles M. Schwab made a personal donation of $25,000 to the fund.

C. M. SCHWAB WINS CHICAGO

E. M. Hurley and C. A. Piez Share in Ovation to Shipbuilding Director

En route to the Pacific coast, Charles M. Schwab, Edward M. Hurley and Charles A. Piez, halted for a day, June 28, in Chicago, and at two meetings which had been arranged for them aroused a whirlwind of enthusiasm. An audience of perhaps 1000 gathered at the La Salle Hotel, where a luncheon meeting was held under the auspices of the Illinois Manufacturers' Association, where all three of the Nation's shipbuilding captains spoke. They gave unlimited praise to each other, Mr. Schwab in particular exciting a furore of applause by his tributes to Mr. Hurley, to whom he referred as one of the greatest men he had found in Washington. Both Mr. Hurley and Mr. Piez are former presidents of the Illinois Manufacturers' Association.

Mr. Schwab was serious and humorous alternately, but whatever he said fell on eager ears and the throng did not want him to stop. The comments heard on every side as the big audience slowly filed out of the room were ample proof that good feeling had been engendered and good results accomplished. Mr. Schwab had prepared a speech, but he did not use it, saying he was going to speak from his heart, that he could not do otherwise in view of the great welcome that had been extended to him and his associates. Mr. Schwab and Mr. Hurley mentioned a few figures bearing on shipbuilding work, and Mr. Piez gave some. The manufacturers' meeting included Major-General E. D. Swinton, who evolved the principle of armoring the caterpillar tractor, thereby creating the "tanks"; E. A. Russell, manager of the production division of the local ordnance department, who has refused to accept rank, and General Barry, U. S. A., commanding the Central Division.

In part, Mr. Schwab said:

Workers the Big Factor in the War

"Now, carry this home with you. It's the workers who are the big factor in this war. Those who are taking pride in their work, doing their level best, are just as great fighters as the men in the trenches.

"And remember this: This war is going to create a democracy such as the world has never seen before. The aristocrat of the future will not be the men of wealth, but the man who has done and is doing something worth while. I've grown to be a wealthy man, but my greatest pleasure does not come from it. It comes from the recollection of the duties I have done well. It's the personal effort that counts."

He declared Mr. Hurley, when he organized the shipyards, "bore on his shoulders the greatest responsibility that any man ever bore in his life before, and that he did his work creditably will mark him in history as one of the great men."

"When I went down to Washington I found another Chicago man there. I had not known him as long as I had Mr. Hurley, but when I saw the keenness of this man's face, the energy and decisiveness of his character, I said to him, 'Look here, Mr. Piez, I will come down to Washington if you will stay. Will you stay here and work with me?' He said, 'I will, Mr. Schwab, but I am not sure that we can get along well together. I don't know your style and way of working, and I don't know what is going to happen.'

"I said, 'I don't know any more about you. I am taking the same chances that you are.'

"I was not taking any chances. I knew from his appearance and the way that I gaged his character at that time was not unjustified. Piez, Hurley, and I make a pretty good team. Hurley sometimes goes off on a tangent, and I follow him, but Piez is steady, calm, deliberate, and a good balance weight, and between the three of us we strike a pretty fair average."

Manufacturers Should Plan for Peace Times

Mr. Hurley, who had preceded Mr. Schwab, said the quantity-production shipbuilding machine is practically finished and has begun to function, and that with the Fourth of July celebration, when about 90 ships will enter the water, it is hoped to show what kind of a machine it is. He laid particular stress on manufacturers planning ahead for peace times, not that he wanted them to diminish their activities toward winning the war, but that the "greater our need for ships, the more of them we shall build."

"The more vigorously we fight the war the more tonnage we shall have at our disposal when peace is declared," he said. "I believe that wise foresight now in utilizing this tonnage after the war to develop our own world trade and develop trade particularly in the smaller younger nations will be a direct help to winning the war, not a hindrance. The refrigerator ship that takes beef and pork to our allies to-day will be tomorrow available for California oranges, Oregon apples, corn belt butter, and in helping develop trade in South America, the Pacific, and the Orient. The troopship of to-day will be a Latin-American, South African, and Australian passenger and cargo carrier to-morrow, bringing our customers from those countries to market and taking their purchases to their doors.

"But ships will be of little use unless the American business man has by that time learned to think in terms of ships and world trade. It is possible for every manufacturer and business man to begin preparations now and success in employing our merchant marine hangs squarely upon manufacturing efficiency."

Praise for President Wilson

Mr. Hurley praised President Wilson. "The President," he said, "knows more about costs than any of you would believe," and speaking of the $100,000,000 appropriation allotted him by Congress said "he personally kept his own accounts and you may be cofident that every dollar was carefully expended under his direction."

"The President has been steadfast in his determination that there shall be no profiteering in this war, and I am willing to stand sponsor for the fact that he knows just what constitutes profiteering and, on the other hand, knows what constitutes a margin of profits that enables a manufacturer to expand his plant to meet the nation's needs in this war."

May Production of Ships Exceeded Losses

Mr. Piez said in part:

"Early in the year we figured out that by a gradual ascending rate of production, encouraging England with shipments of steel to speed up her output, some time along in September or October, if conditions were fair, and the navy succeeded in reducing the number of submarines, we could reach a point at which the output of ships would at least equal the monthly sinkings," he said. "In May, the report has it, 258,000 gross tons were sunk. That is the equivalent of about 390,000 dead weight tons as we measure it. America produced 260,000 tons and England 180,000 tons, or 440,000 tons of production against only 390,000 tons of sinkings, leaving us 50,000 tons to the good for May. We expect to make the disparity on the favorable side so great that there will no longer be any question whether we can maintain 3,000,000 or 5,000,000 of our boys abroad."

He declared that the Middle West is playing a great part in the shipbuilding program and that while heretofore there has been concentration upon the manufacturing concerns along the coasts, facilities inland will soon be greatly drawn upon.

D. E. Felt of the Felt & Tarrant Mfg. Co., presided at the luncheon.

In the evening Mr. Schwab addressed an immense audience of workingmen and others at a meeting in the International amphitheater at the stockyards, where he made a plea for the full-hearted support of the worker. Here, also, he was accorded an ovation, as were Messrs. Hurley and Piez.

The Boston office of the Sullivan Machinery Co. is now located at Room 516, Boston Safe Deposit & Trust Co. Building, 201 Devonshire Street. George E. Wolcott is New England sales manager.

Exports of Iron and Steel Show Increase

Decline in Total Value of Products Sent Abroad —Shipments on Government Transports Not Included—Little Available for Commercial Uses

WASHINGTON, July 2.—The official statistics showing the exports of iron and steel for May present the anomalous condition of a substantial increase in shipments of tonnage commodities and a material gain in the exports of machinery combined with a slight decline in the total value of all forms of iron and steel sent abroad during the month, as compared with the figures for April. The explanation offered by experts here is that there has recently been a steady decline in the shipments for commercial purposes of miscellaneous iron and steel products not included under tonnage commodities or the machinery schedule and that the bulk of the more highly finished tonnage commodities, representing greater values, are now being sent to France on Government transports and therefore do not appear in our foreign trade statistics. There can be no doubt that the increasing use of Government transports for the shipment of war material is responsible for apparent shrinkages when, if the combined figures for official and commercial exportations were available, the movement would continue to show a steady upward trend. The tightening of governmental control upon the iron and steel industry is clearly reflected in the steadily lessening quantity of material available for foreign shipment through commercial channels.

The total exports of iron and steel by values in May showed a loss of 7 per cent compared with the same month of 1917, and fell 19 per cent short of the record total of last December. Tonnage commodities declined 16 per cent below the exports of May, 1917, and 23 per cent below the high water mark reached in September, 1916, although they exceeded the shipments

Exports of Iron and Steel

	May		Eleven Months	
	1917 Gross Tons	1918 Gross Tons	1917 Gross Tons	1918 Gross Tons
Pig iron	61,112	....	751,524	....
Ferromanganese	....	a477	....	a4,590
Ferrosilicon	....	a237	....	a8,564
All other pig iron	....	a21,853	....	a340,791
Scrap	11,382	266	227,909	22,067
Bar iron	7,886	3,219	58,730	45,096
Wire rods	15,666	10,313	130,130	182,040
Steel bars	62,541	48,970	697,740	579,148
Billets, ingots and blooms, n.e.s.	168,158	159,299	1,745,363	1,837,919
Bolts and nuts	2,204	2,478	26,748	28 095
Hoops and bands	6,405	3,902	42.213	55,107
Horseshoes	319	573	4,022	8,929
Cut nails	368	478	4,251	4,695
Wire nails	10,133	6,278	114,857	103,910
All other nails, including tacks	1,297	857	16,513	12,116
Cast-iron pipes and fittings	6,364	10,747	68,470	76,338
Wrought pipes and fittings	12,563	6,862	153,400	93,223
Radiators and cast-iron house-heating boilers	562	131	3 887	2,624
Railroad spikes	1,332	1,975	16.828	14,500
Steel rails	49,260	52,211	562,336	405,278
Galvanized iron sheets and plates	8,141	7,109	82.296	71,888
All other iron sheets and plates	5,244	3.982	44,851	51 860
Steel plates	54,849	48,949	361,199	428.576
Steel sheets	15,789	15,922	107,048	164,063
Ship and tank plates, punched and shaped	....	a4.715	....	a31,597
Structural iron and steel	34,764	13 717	319,971	223 076
Tin and terne plates	23,283	37,350	207,489	221.269
Barb wire	8,543	19,579	285,834	161 952
All other wire	19,735	10,792	220.310	157 128
Total	587,900	493,241	6,253,831	5,335,872

a Not separately enumerated prior to July 1, 1917.

Exports of Machinery

	May		Eleven Months	
	1917	1918	1917	1918
Adding machines	$205,907	$177,628	$1,636.460	$1,886,816
Air-compressing machinery	81,247	378,042	1,026,265	1,541,940
Brewers' machinery	3,853	553	57,779	227.685
Cash registers	70,449	54,589	1,284.618	479,388
Parts of	2,676	6,938	111,053	58,891
Concrete mixers	.....	a42,000	.....	a285 948
Cotton gins	6,298	8 131	102.209	125.680
Cream separators	68,219	93,837	438.567	562.249
Elevators and elevator machinery	189,592	214.367	1,900,457	1,803.792
Electric locomotives	25,755	16,740	508.807	153.911
Gas engines, stationary	71,548	65,853	637.192	551.573
Gasoline engines	2,416,745	3,706,031	16,303,160	31 389.241
Kerosene engines	.....	a951,970	.....	a5,631,523
Steam engines	1,410,860	3,832.370	17.222,052	38 068.042
All other engines	347,683	273,904	4,489.453	3.368,457
Parts of	2,945,271	.....	17,110,182	.....
Boilers	.....	a258,511	.....	a3 360 474
Boiler tubes	.....	a601,181	.....	a5,938,142
All other parts of engines	.....	a2.815.416	.....	a18.503,935
Excavating machinery	.....	a268,139	.....	a1.128 915
Milling machinery, flour and grist	59,576	158 217	1,042,066	947.322
Laundry machinery, power	45,435	40,381	313,975	347 399
All other	17,667	43.769	282 444	279.501
Lawn mowers	22,325	20,632	163,993	223.253
Metal-working machinery (including wood-working tools)	6,515,007	.....	76,348,162	.....
Lathes	.....	a1.096 708	.....	a14.666,967
Other machine tools	.....	a1.312,310	.....	a10 326,009
Sharpening and grinding machines	.....	a644,007	.....	a5 992.247
All other metal-working machinery	.....	a2,795 538	.....	a23,122.706
Meters, gas and water	30.997	26,942	1,042 066	430.494
Mining machinery, oil well	189,876	212 841	1,742,026	1.871.491
All other	787,753	629.663	9 008.906	9,702 738
Paper-mill machinery	190,302	216,608	1.715,021	1.773 083
Printing presses	149,698	111,636	1,690.497	1.236,173
Pumps and pumping machinery	569.224	650 972	5,597,292	6 056 570
Refrigerating and ice-making machinery	72,152	80 667	790,204	1 337.965
Road-making machinery	.....	a61.130	.....	a477.902
Sewing machines	682.948	546,451	5,730 301	7.214.952
Shoe machinery	111.472	112 835	1,226,203	1.396,850
Sugar-mill machinery	366 204	555,401	10,316.369	11,158 459
Textile machinery	290.266	729,999	3,194 803	4,932 340
Typesetting machines	95,345	120.223	1.012,280	1.119,861
Typewriting machines	818.728	730,824	10,100.421	6,905,018
Windmills	131 341	68,703	844,123	988.858
Wood-working machinery, saw mill	32,640	86.931	424.518	877 392
All other	111.895	54,842	913,294	874.256
All other machinery and parts of	3 823,524	4.225.161	38,696,782	38,230.425
Total	$22.960,478	$29,099,591	$234,403,278	$267,556,833

a Not separately enumerated prior to July 1, 1917.

Imports of Iron and Steel

	May		Eleven Months	
	1917 Gross Tons	1918 Gross Tons	1917 Gross Tons	1918 Gross Tons
Ferromanganese	2,019	4,138	69,924	27,520
Ferrosilicon	1,114	100	7,846	5,273
All other pig iron	1,189	....	33,997	16,618
Scrap	16,372	3,546	208,236	63,013
Bar iron	33	39	4,241	2,360
Structural iron and steel	133	248	926	7,127
Hoop and band iron	24	....	24	....
Steel billets without alloys	2,899	1,974	12,575	34,373
All other steel billets	717	1,617	10,473	8,952
Steel rails	1,491	....	13,097	7,985
Sheets and plates	44	84	1,727	2,045
Tin and terne plates	2	....	610	32
Tin scrap	....	628	....	7,516
Wire rods	1	2,011	2,064	5,475
Total	26,038	14,385	366,740	187,895
Imports of Manganese, Ore and Oxide				
Manganese, ore and oxide of	81,269	29,837	593,310	519,591

in April of this year by a little more than 5 per cent. Shipments of machinery, which made a substantial gain over those of April of this year, scored an increase of 26 per cent over May, 1917, and fell less than one-third of 1 per cent below the record total of last December. Exports of metal-working machinery, which have been tending downward for many months, declined 10 per cent as compared with May, 1917, and 40 per cent from the maximum figures of May, 1916.

For the 11 months ended May, 1918, exports of iron and steel by values increased 3 per cent over the corresponding period of 1917, which was nearly 100 per cent in advance of any previous year. Tonnage commodities fell 15 per cent below the total of the corresponding period of 1917, machinery gained 14 per cent, and machine tools lost 32 per cent.

The value of all exports of iron and steel products in May was $100,594,314, as compared with $107,362,635 for the same month of 1917, and $72,926,180 for May, 1916. For the 11 months ended May, 1918, the aggregate was $1,042,391,331 as against $1,010,469,046 for the same period of 1917, and $544,958,836 in 1916. Exports of machinery in May were valued at $29,099,591 as compared with $22,960,478 for the same month a year ago. December, 1917, still holds the record for exports of machinery, the total shipments of that month aggregating $30,051,092. For the 11 months ended May, 1918, the exports of machinery were valued at $267,566,833 as compared with $234,403,278 for the same period of 1917. Shipments of metal-working machinery in May aggregated $5,848,563 as compared with $6,515,007 for the same month of 1917. For the 11 months ended May, 1918, machine tool exports totaled $54,107,929 as compared with $76,348,162 for the same period of 1917. Details for the exports of machinery in May, 1916 and 1917, and for the two ten months' periods are given in the accompanying table.

Exports for which quantities are given aggregated 493,241 gross tons in May, 1918 as compared with 587,900 tons for the same month of 1917. The high record for this movement was made last December, when the total was 656,044 gross tons. For the 11 months ended May, 1918, these exports totaled 5,385,872 gross tons as compared with 6,253,831 tons for the corresponding period of 1917. The accompanying table shows the exports for May and for the 11 months ended May, 1917.

Imports of iron and steel in May, 1918, amounted to a little more than 50 per cent of those for the same month of 1917, the total being 14,385 gross tons as compared with 26,038 tons in May, 1917. This is a small gain over April of the current year. The steady decline in imports throughout the fiscal year now closing has brought the total for the 11 months down to 187,895 gross tons as compared with 366,740 tons for the corresponding period of 1917. Imports of iron and steel and of manganese for May and for the 11 months of 1917 and 1918 are shown in the accompanying table.

W. L. C.

The structural iron workers of Chicago have signed agreements for the next three years at 87½c. an hr., the new rate being an increase from 70c. an hr.

Industries for War Work

The committee for the readjustment of the industries for war work of the American Society of Mechanical Engineers, the appointment of which was noted in the last issue, plans to aid directly in the placing of all the industrial resources of the country—especially those in the mechanical engineering field—in touch with one another and with the proper Governmental bureaus, so as to make it possible for all of them to use their facilities to the best advantage for the winning of the war. The committee at first will probably list names of manufacturers, especially those of small capacities, that are able to perform some kind of war work and who have found it difficult to obtain direct Government contracts. These manufacturers would be placed in touch with larger contractors or with the Government bureaus with a view to furnish them with such work as is necessary at the present time. In this way it is hoped that the facilities of non-essential industries may be more than ever mobilized for essential war manufacture.

The American Society of Mechanical Engineers has undertaken this work, because it is believed that the mechanical engineers of the United States are more closely in touch with the manufacturing facilities than any others, and with the co-operation of the membership of the society it is expected that the work planned for can be carried out in an effective manner. Representatives of the society have been appointed in various districts corresponding to those into which the country is divided by the War Industries Board with regard to munitions manufacture.

The committee plans also to arrange for the selection of specialists for certain phases of the work. One of these specialties has already been partly cared for through the activities of the machine shop committee of the society, of which Ralph E. Flanders, manager of the Jones & Lamson Machine Co., Windsor, Vt., is chairman. This committee will handle, particularly, the conservation and production of heavy machine tools for ordnance work.

Temporarily the office of the committee will be at the offices of G. K. Parsons, the chairman, at 29 Pine Street, New York. All organizations which are working along similar lines are asked to communicate with this committee for the sake of co-ordination and effectiveness. Manufacturers who have equipment that is idle or that is not employed on regular war work, and who would like to have it so employed, as well as makers of munitions of war and other war material who have contracts to sublet, are also asked to communicate with the committee.

To Promote Power Plant Efficiency

The United States Fuel Administration announces the appointment of Henderson W. Knott to manage the field force of engineers and inspectors which is at work among the power plants of the country, carrying out a campaign of instruction and inspection designed to bring the use of fuel for the production of power to the highest possible efficiency and economy. Mr. Knott has been the general manager of the Morgan Crucible Co., New York. His appointment is a part of the plan originated by David Moffat Myers, advisory fuel engineer of the Fuel Administration, to have each of the 250,000 steam plants in the United States visited by a competent man who can make suggestions and report in connection with the questionnaire originated by Mr. Myers, working with committees from the four great engineering societies. This work will naturally require a large number of inspectors devoting their time to traveling among the steam plants.

This field force will be organized by states in order to give it greater force and efficiency. Many of the state heads who work directly under the State fuel administrators have already been appointed, and Mr. Knott, co-operating with Mr. Myers, will complete the list of state appointees. Mr. Knott will, at an early date, visit the states already organized to study the work being done by the men in the field, and to speed up the inspection program.

American Society for Testing Materials

Sulphur and Phosphorus in Steel Specifications—Cast-Steel Anchor Chain—Moving Photomicrographs—Co-operation in Industrial Research

CONSIDERING the unusual conditions in industry and the increased cost of traveling, the attendance at the twenty-first annual meeting of the American Society for Testing Materials, Hotel Traymore, Atlantic City, last week, was not only larger than expected but was equal to that of last year. It was evident that there is an increased interest in specifications due to the great expansion in this field for war purposes. The sessions were enthusiastic and well attended. The sulphur and phosphorus question in steel specifications was the only one that caused any decided difference of opinion, but a satisfactory solution was arrived at. An unusual feature of the convention was the topical discussion on industrial research on Wednesday evening, introduced by Dr. Henry M. Howe. The success of this discussion was pronounced and it emphasized the vital importance of this subject to the nation's present and future welfare. Prominence was given to the subject of anchor chain in a paper on cast-steel chain—a new departure in steel foundry problems. Another noteworthy feature was the presentation of a moving picture showing a motion photomicrograph of fatigue failure of wrought iron—an achievement probably never before accomplished. The absence of the society's secretary, Prof. Edgar Marburg, was a source of regret and the fact that he had been obliged very recently to go to a hospital was the cause of a telegram of cheer and sympathy sent from the convention at its Tuesday morning meeting. The president, Brig.-Gen. William H. Bixby, was unable to be present because of war duties in the West. Telegrams of greeting were exchanged between him and the society.

New and Revised Specifications

OF the committee reports, one of the most important and to which much time was devoted, was that of committee A-1 on steel, presented by its chairman, J. A. Capp, at the session Wednesday morning. Previous to the convention this committee had held on Monday evening a protracted session devoted largely to the question of sulphur. It was argued that in view of the conditions in the steel industry as to sulphur and phosphorus, some recognition was imperative by the society in its standard specifications. While this was finally unanimously agreed to as to certain specifications, on some others there was a decided difference of opinion. This was so marked as to the latter that it resulted in the committee's being obliged to bring to the floor of the convention the particular specifications on which its vote was equally divided and on which the chairman would neither cast a deciding vote nor make a recommendation. Such a necessity is a very unusual procedure.

Sulphur in Steel

The committee, in its final report, recommended that to a list of 35 standard specifications on steel there be added at the head of each specification a clause reading

> that, in view of the abnormal conditions obtaining in the steel trade, the sulphur limits be raised 0.01 per cent in all steels and the phosphorus limit also be raised 0.01 per cent in acid steels for the period of the war and until further notice.

The committee asked permission to print the note as recommended at the head of each specification agreed upon, the understanding being that a specification is not thereby otherwise changed in any respect. This was sanctioned by the convention by the usual vote and applies to most of the Society's list of steel specifications, after adoption by letter ballot.

On three specifications the committee was divided in its opinion. On the specifications for structural steel for cars, A 11-16, the committee voted 9 to 4 in favor of the addition of the sulphur and phosphorus clause. The convention sanctioned the opinion of the majority of the committee and the clause will therefore be added to this specification.

The question of any change of this kind in the specifications for boiler and fire box steel for locomotives, A 30-16, caused considerable debate. The committee's vote had been equally divided as to the addition of the clause to this specification. J. J. Shuman, Jones & Laughlin Steel Co., Pittsburgh, in discussing this matter, said that the conditions confronting the steel industry were probably not fully realized; that the source of low phosphorus and sulphur raw materials has changed; that a steelmaker cannot now achieve the low percentages heretofore possible, and that the situation is not a theory but a condition. A. A. Stevenson, Standard Steel Works Co., Philadelphia, said that his position in this matter was prompted entirely by his interest in the welfare of the society and that, in the case of the specifications under discussion, it would, in his opinion, reflect on the welfare of the society to take affirmative action. The vote to add the new clause to these specifications was in the negative.

The same action was taken in regard to the specifications for boiler rivet steel, A 31-14, the committee's vote having been equally divided.

The committee's recommendations affecting standards and tentative standards were divided into two groups: Revisions proposed at the last annual meeting and now recommended for adoption by letter ballot either as presented last year or in slightly amended or supplemented form; revisions proposed for the first time which the committee recommends be referred to letter ballot by the necessary nine-tenths vote at the annual meeting.

Of the first group those for adoption without amendment included: For carbon steel and alloy steel axles, A 18-16; for carbon steel car and tender axles, A 21-14; for welded steel and wrought iron pipe, A 53-15, and for boiler and fire box steel for locomotives, A 30-16. These were minor in character and were adopted. Revisions recommended for adoption as presented in 1917 and slightly amended include specifications for quenched and tempered carbon steel axles, shafts, etc., A 19-16; for quenched and tempered alloy steel axles, shafts, etc., A 63-16; for lap welded and seamless steel boiler tubes for locomotives, A 28-16; for lap welded and seamless steel and wrought iron boiler tubes for stationary service, A 52-25, and for automobile carbon and alloy steels, A 29-16. All of these are brief except those for lap-welded and seamless steel boiler tubes for locomotives, which are extensive.

Billets for Forgings

In the second group an important specification whose revision was proposed for the first time and recommended for adoption was that for blooms, billets and slabs for carbon steel forgings. In its report last year the committee proposed certain revisions in these speci-

fications relating exclusively to the chemical requirements of carbon and alloy steel billets and stated that the necessary revisions would be presented at the 1918 meeting. The specifications are divided into two classes differing in methods of sampling for chemical analysis and in chemical requirements. The section covering check analysis is recommended to be replaced by another which covers this in more detail.

It divides forging billets into two classes. For billets of class 2, the purchaser or his representative may select one top-cut billet from which to make check analyses to represent each melt. Two sets of drillings shall be taken from the top face of this billet at points on the same diagonal of the billet. The drillings shall be taken with a ⅝-in. drill parallel to the axis of the ingot as cast. The distance from the center of the billet shall be respectively 15 and 80 per cent of the length of the half diagonal of the billet. From the drillings taken at the 80 per cent point a complete analysis may be made. The chemical composition thus determined shall conform to the requirements specified. From the drillings taken at the 15 per cent point a carbon determination may be made. The difference between the carbon content of the drillings from the 15 per cent point and that of the drillings from the 80 per cent point, expressed as a percentage of the latter, shall not exceed 15 per cent for billets 15 in. or under in thickness nor 20 per cent for billets over 15 in. in thickness. If in any melt the drillings taken as indicated do not conform to the requirements, additional drillings may be taken in a similar manner after making a further top discard from the material from each ingot of at least 10 per cent of the original ingot weight. The results of this analysis shall conform to the requirements or the melt represented shall be rejected.

In the section under chipping important changes were recommended. The present specifications call for a chipping of the billets to a depth of not over ½ in. unless otherwise specified and so done as not to cause laps when the billets are properly forged. The new recommendations provide that

billets may be chipped to remove surface defects provided that the depth of chipping does not exceed 1/10 in. for each inch of dimension concerned, up to a maximum depth of ¾ in., and provided that the width of the chipping is at least four times its greatest depth; except that in the case of slabs where the width is at least twice the thickness, the depth of chipping on the wide surfaces may exceed this allowance by 50 per cent, up to a maximum depth of ¾ in. In special cases, particularly large alloy steel billets where it is necessary and is not injurious, greater depth of chipping may be permitted by special agreement between the manufacturer and the purchaser.

Considerable opposition developed in the committee, the vote standing 48 affirmative to 27 negative. The 90 per cent vote of the convention was accorded the motion that these be made standard subject to the usual letter ballot.

New Standards

Four tentative standards, which had been before the society for two years, were made standard without amendment, as recommended in this report. These were those for steel track spikes, A 65-16 T; for steel screw spikes, A 66-16 T; for carbon steel bars for railroad springs with special silicon requirements, A 68-16 T, and for elliptical springs for automobiles, A 69-16 T.

Because of a demand for low carbon steel truck bolts, the committee was authorized to print as tentative a new specification to cover this new condition, which calls for a bolt having 55,000 to 70,000 lb. per sq. in., tensile strength and not heat treated.

The tentative specifications for carbon tool steel, A 71-17 T, were not recommended for adoption as standard. They are to be continued tentative for another year.

The question of bend test requirements in steel specifications was reported as still being investigated by means of a comprehensive series of tests which had been delayed by pressure of war orders.

Specifications for locomotive boiler tubes were revised in the sections in hydrostatic tests, number of tests, finish and marking so as to harmonize them with the standard specifications for lap-welded and seamless steel and wrought iron boiler tubes for stationary service. The committee is co-operating with the boiler code committee of the American Society of Mechanical Engineers, through the American Society for Testing Materials representatives on a joint conference committee with reference to revising the tentative specifications for boiler and fire box steel to differentiate more sharply between the two grades. The specifications were continued as tentative.

Cast-Steel Chain Specifications

A new phase of the work of the steel committee has been the covering of the subject of cast-steel chain. The demand for anchor chain in connection with the work of the Emergency Fleet Corporation has been so great that it was decided to undertake the preparation of specifications for this material. Although a sub-committee on cast-steel chain was organized as recently as March 16, proposed tentative specifications for electric cast-steel anchor chain were presented. These specifications cover the cast steel to be used in all parts of the complete chain, including steel links, enlarged links, end links, shackles and shackle pins for anchor chain, 1⅜ in. and over. The steel is to be made in the electric furnace and shall be produced in dry sand molds or cores. The committee was congratulated on having met so promptly a vital need and the proposed specifications were made tentative subject to letter ballot.

The Rail Situation

The sub-committee on rails in a report on the rail situation stated that some of the railroads have increased the weight of section, particularly when this is decidedly over 100 lb. per yd. and report greatly reduced cost of track maintenance and reduction in numbers of failures as well as better riding track. One road now contemplates a section weighing 200 lb. per yd. On heat-treated rails the committee states that such rails when put in service generally showed markedly greater resistance to abrasion but some failed due to brittleness in the track. The results of tests indicate that heat-treated rails may have a future.

Committee A 5 on corrosion of iron and steel, through its chairman, S. S. Voorhees, made an extensive report of 79 printed pages showing the progress made in this work of exposure of various metal sheets at Pittsburgh, Annapolis, Md., and Fort Sheridan, Ill. No conclusions were presented.

Higher Sulphur Limits in Cast Iron

At the Tuesday morning session Dr. Richard Moldenke presented the brief report of committee A3 on cast iron. This contained a suggestion as to the desirability of introducing a hardness test for such iron and for the study of its behavior under super-heated steam. The committee's recommendation last year that the sulphur limit in light castings in the standard specifications for gray iron castings be raised from 0.08 to 0.10 per cent was adopted and referred to letter ballot.

G. Lanza presented the report of the committee E 1 on methods of testing of which he is chairman. No good reason was found for recommending changes in the design of present tension test specimens, as the result of careful investigations.

Report of the Executive Committee

The executive committee's report is always an important part of the deliberations of the society. This year this report covered 40 printed pages. In the past year this committee has given much consideration to an increasing demand that the period between the publication of successive issues of the book of A. S. T. M. standards be lengthened from two to three years. This change was adopted by a vote of the convention by referring the appropriate amendment of the by-laws thereby concerned to letter ballot of the society.

Attention was called to the fact that the society's total membership is now 2261, the net increase for the year having been 94 as compared with 96 for the previous year.

A new committee to be known as "A 7 on Malleable

Castings" has been created by authorization of the executive committee and the present sub-committee on malleable castings of committee A 3 on cast iron has been discontinued. The latter is now a new committee, designated committee A 7 on malleable castings.

The financial phase of the report showed that the deficit at the end of the fiscal year, which had grown to $6,407.03 by the end of 1915, has been converted into a surplus of $3,140.09 by the end of 1916 and to one of $11,955.53 by the end of 1917, sustaining the wisdom of the measures taken in recent years toward strengthening the financial condition by raising the annual dues from $10 to $15 at the beginning of 1916. From the sale of publications $5,573.41 had been received.

An important action, ratified by the convention, was the authorization of the election by the executive committee of an assistant secretary and assistant treasurer.

The report showed that for this year there had been presented for consideration revisions to 22 standard specifications, that 30 tentative standards had been recommended for adoption, that 15 new tentative standards had been proposed, that 8 revisions to tentative standards had been offered and recommended to be continued, and that 20 tentative standards be continued without revision.

The important recommendations regarding proposed American Engineering Standards is referred to later in this account of the convention.

Co-operation in Industrial Research

BECAUSE of the importance of co-operation in industrial research and because of the fact that its relation to our position as a world power in industrial and economic relations now and after the war is vital, it was decided that a carefully planned topical discussion on this general subject might afford the society an unusual opportunity to render a worthy national service. The movement is understood to have been urged and promoted by Professor Marburg, the society's secretary. It was therefore decided to make this one of the leading features of this year's annual meeting. The entire evening of Wednesday, June 26, was devoted to it.

Professor Marburg, in his printed opening announcement of this feature, very aptly said:

> Indeed, if the war has proved one thing, it is that not only the safety of a nation in war but even its protection against the menace of war, depends largely on the degree to which she has attained complete independence from other nations in the matter of resources essential to the prolonged conduct of war. By resources is meant not merely physical things, such as raw materials, needed in the greatest variety and abundance, and adequate means of transportation, but the sum total of scientific knowledge and technical skill at the command of the nation. Indeed, it is to the importance of this last that this topical discussion is especially designed to direct attention.

The National Research Council has inaugurated an Industrial Research Section which shall consider the best methods of achieving such organization or research within an industry or group of related industries as, for example, industries using the same raw materials or with similar waste products. It considers that co-operation by capital, labor, science and management constitutes the best general means of financing and directing the extended laboratory investigations and the large-scale experimental and developmental work required for adequate industrial research.

The discussion was introduced by Dr. Henry M. Howe, a past-president of the society, and now chairman, engineering division, National Research Council. Dr. Howe's remarks were as follows:

"A very great advance toward co-operation in industrial research was made in 1868, when on the initiative of Sir Lowthian Bell, the Iron and Steel Institute came into being, and replaced the habitual secretiveness of the British iron master with discussion of the principles and practice of his art. Only three years later, in 1871, the American Institute of Mining Engineers was founded under the stimulating leadership of Holley, Drown and Raymond for a like but even broader effort to replace secrecy with discussion.

"Another great leader, Judge Gary, took an important step when he started his steelmakers' dinners, and brought those who had been intent chiefly on cutting each others throats into aiding each other.

"And now we propose another step, that wherever feasible the industries shall not only permit such disclosure and discussion of their discoveries as occur at the meetings of technical societies, but shall co-operate in making their discoveries. The advantages of this plan are naturally inversely as the size of the individual corporation. Co-operation in research between small companies lessens the disadvantage of their smallness. To corporations so large that they feel but lightly the cost of their researches, the advantages of co-operation will weigh correspondingly lightly against its apparent disadvantage of transferring capital in the form of knowledge to others who may not repay in full.

"Small manufacturing companies so fortunate as to feel that they can trust each other may well look at co-operative research as simply one step in the inevitable enlightenment of human ways. Each step has seemed visionary and Quixotic to those who lack vision, but to the natural leaders it has seemed an obvious extension of the displacement of antagonism by co-operation. The setting up of specifications and standards of reasonableness by this society is one example. Another is the formation of conferences between the selling departments of the competitors in a given industry.

"Though the immediate motive for founding an industry is to make money, yet in another sense each exists primarily to serve the public and incidentally to gain for its projectors and managers a just reward for their courage in supplying funds and for their skill and energy in using them, for their product can be sold only as the public profits by buying it. The pecuniary reward should be roughly proportional to the benefit given the public. Clearly John and James can jointly serve the public better, and hence can command greater pay from the public, that is greater profits, if each serves the public not with his own knowledge alone but with that of his competitor as well.

"Every research consists of four tolerably distinct parts: selection, planning, execution and interpretation.

"First out of the immeasurable area of our ignorance we select a certain limited field the exploration of which promises the greatest profit. The problem to be solved should be enunciated with perefect sharpness. The selection of this field demands to-day first a knowledge of the problems which are pressing on our military and other departments, and second, very sound judgment. In other times the pressing needs of the industry dictate the selection. How much good energy has been wasted in the desultory exploration of some little plot which has happened to catch the young investigator's fancy?

"Next the research should be so planned that its results will have the greatest promise of yielding a clear and decisive solution of the problem, a sharp answer to a sharp question. This requires complete familiarity with the subject, and especially with existing knowledge and with the tests applicable. For instance, if we study the influence of a process on the mechanical properties of a metal or other product, we should either provide for tests which will measure directly the properties needed in the service in view, or if as usual we cannot reproduce in our tests the most trying conditions of service, then we should provide plural kinds of tests, increasing the number of kinds in proportion to the indirectness of their evidence as to fitness for service. Every kind of test which throws light on service fitness should be used. The consideration that new and unforeseen services are constantly developing argues for widening the range of tests for any given product.

"Third, the process itself and these several tests

should be made by those thoroughly familiar with them, each detail going to an expert.

"Fourth, the results should be interpreted in a strictly philosophical spirit, without bias or reference to preconceived hypotheses. This work of interpretation should indeed be open to all connected with the research. Yet because what is everyone's duty is no one's, certain men should be charged directly with this vital task, knowing well that their inferences are subject to review by all their colleagues and will be accepted only as they are just and reasonable.

"Each of these four phases of research needs special qualifications: For selection, prophecy and breadth of view; for planning, imagination and administration; for execution, skill and trustworthiness; for interpretation, philosophy.

"This mere recitation of the needs of research is a demonstration of the need of co-operation, for it is only a few of the laboratories of the very great industries that have either the various kinds of men with these various gifts, or the means to experiment on so wide a scale. Scattered through the many institutions of learning and the laboratories of the smaller industrial works there are innumerable investigators, each with certain intellectual gifts, each skilled in certain kinds of tests, but few with broad knowledge of the needs of the Government or of any given industry to guide them in their selection; relatively few with the breadth of view needed for wise planning; very few if indeed any with skill in all the different kinds of tests needed; and relatively few endowed with the philosophical spirit needed for interpretation. Yet these men collectively have enormous potencies for research, if their several gifts and skills can be brought into broad co-operation. How often do we see results reached with extraordinary patience and accuracy not utilized but prostituted to support a preconceived hypothesis which, rightly viewed, they discredit?

G. H. CLAMER

The Newly Elected President American Society for Testing Materials

"It is our defect as a race that this sort of team play comes less naturally to us than isolated individualistic research, in which each man obeys his own impulses, and is a law unto himself. But as with men so with nations, development implies first of all the cure of our inborn defects. That the unmitigatedness of our individualism is a defect we are reminded sharply by the present grave threat of our national enslavement by a people far less intelligent, energetic and self-controlled than we, but as coherent as we are incoherent, as given to team play, as desirous of support, as we are self-reliant and detached. Distasteful as it is to us to act on our motto of 'United we stand, divided we fall,' if we are to survive our strong units must learn to cohere.

"Experience with co-operative research has proved abundantly that, wisely directed, it may stimulate instead of lessen individual initiative, which is of the first importance.

"One of the aims of the National Research Council is to induce the co-operative spirit wherever possible in industrial research, and research for the immediate benefit of the Government. The Engineering Division of the Council expects to devote part of its energies to this work, and here it counts confidently on the support of this society. It asks you as individuals and as a body to aid it by pointing out fields in which co-operative research is urgently needed, by advice in planning our researches, by the aid of your industrial and collegiate laboratories in executing the tests, and by your wisdom in discussing the results. It hopes that you will co-operate with it and it with you."

The subject was further developed by an address by Dr. John Johnson, secretary National Research Council, and formerly chemist research department American Zinc Lead & Smelting Co., on "Recent Developments in Great Britain"; by Dr. Arthur D. Little, president Arthur D. Little, Inc., an "Organization of Industrial Research," by Dr. Charles L. Reese, chemical director, E. I. Du Pont de Nemours & Co., Wilmington, on "Developments in Industrial Research," who related the importance of such work to his company and the rapid strides made, and by Frank E. Gorrell, secretary National Canners Association, Washington, on "Co-operative Research in the American Canning Industry."

American Engineering Standards

At a special meeting of the executive committee on Wednesday afternoon, favorable action was taken on the question of a proposed American engineering standards committee. The steps leading up to this proposition are recounted in the Committee's annual report and are partly as follows:

In August, 1916 the society was invited by the American Institute of Electrical Engineers to appoint three representatives on a proposed joint committee consisting of three representatives each from the following five societies: American Society of Civil Engineers, American Society of Mechanical Engineers, American Institute of Mining Engineers, American Institute of Electrical Engineers, and American Society for Testing Materials; to consider ways and means of bringing about co-operation in American engineering standards. This invitation was accepted and A. A. Stevenson, J. A. Capp and the secretary-treasurer were appointed as the representatives of the society. They were later empowered, in pursuance of a recommendation from the joint committee, to represent the society in the development by the joint committee of a scheme of organization of a proposed American engineering standards committee, with the understanding that by this action the society is not committed in advance to permanent participation in the proposed organization.

At the meeting of the executive committee in June, 1917, a report from the joint committee, containing a proposed scheme of organization of an American engineering standards committee, was presented. A sub-committee of five—two in addition to the three A.S.T.M. representatives on the joint committee—was appointed to study this report and to present its recommendations to the executive committee.

The matter was brought before the society's Thursday morning meeting by J. A. Capp. Those present voted approval of the scheme as recommended and that it be referred to letter ballot. The adoption of this plan by the five leading engineering societies is expected to result in the formation of American standards of various materials, but to in no way interfere with the work or influence of each society. Already the mining engineers and the mechanical engineers have approved the plan and it was expected that the electrical engineers, then in session at Atlantic City, would also take the same action. Favorable action by the civil engineers is expected soon.

International Aircraft Conference

An important address of the convention was that of Albert Ladd Colby which preceded the topical discussion on industrial research on Wednesday evening.

The society was invited by the British Engineering Standards Committee to be represented at an International Aircraft Conference in London, to which delegates had been invited from the United States Army, the United States Navy, the U. S. Bureau of Standards the International Aircraft Standards Board, the Manufacturers' Aircraft Association, the American Society of Mechanical Engineers and the Society of Automotive Engineers. The executive committee accepted this invitation and appointed Mr. Colby to represent the society at that conference in matters affecting materials and testing. Mr. Colby spent a period of about 11 weeks abroad on this work, rendering very efficient and effective service on behalf of the society.

Mr. Colby presented a brief report of his work which will be reviewed in THE IRON AGE, July 11, 1918.

An unusual feature of the convention was the pres-

entation on Wednesday morning for the first time, it is believed, of a motion picture showing motion photomicrographs of the fatigue failure of wrought iron as taken by Prof. H. F. Moore at the University of Illinois. The success attending this attempt was received with considerable enthusiasm and is believed to be prophetic of further surprising achievements and results of this nature. The test was made on a piece of wrought iron, 3/16 in. thick and the area represented in the motion picture was one three hundredth of an inch. The changes in the structure as progressively induced were wonderfully clear and the final formation of cracks was very distinct.

So great was the interest in this matter that the picture was repeated at the Thursday morning session.

Cast Steel Chain

There were very few papers on the program which discussed special topics. The most prominent of these was that on "Cast Steel Anchor Chain" by H. Jasper Cox which is abstracted on other pages of this issue. It created considerable interest and presents a decidedly interesting development made necessary by the war. It was stated that the wrought iron chain capacity of the country is only about 33 per cent of the amount of anchor chain needed and that already much of this chain has been ordered.

Two technical papers were presented, one by D. J. McAdam, Jr., on "Grain Size of Iron as Affected by Temperature" which was briefly discussed by Zay Jeffries, director, research department, Aluminum Castings Co., Cleveland, and one by J. G. Ayers, Jr., in "Changes Within the Critical Range of a Given Steel."

Two papers on hardness embraced "A Simple Type of Brinell Testing Machine of 500 Kg. Load," by A. V. De Forest and one on "A New Method of Obtaining Brinell Hardness," by J. G. Ayers, Jr.

Testing Aircraft Materials

Two highly interesting papers in the aircraft field were those by Prof. G. B. Haven, Massachusetts Institute of Technology on the "Effect of Moisture on the Tensile Strength of Aircraft Fabrics" and another by Irving H. Cowdray on "Transverse Testing Under Non-Uniformly Distributed Load as Applied to Airplane Wing Ribs," Massachusetts Institute of Technology. Both of these papers revealed the advance already made in this field and were prophetic of what may come in this line as aircraft materials are standardized.

The third session on Tuesday evening was devoted to the president's annual address and to a reception. In the absence of the president, General Bixby, his address "Engineering Societies, Their Utilities and Justification" was read by S. S. Voorhees, Bureau of Standards, Washington, a vice-president. General Bixby opposed the merger of this society with any other engineering organizations.

The Concrete Ship

Following this, a very interesting address was delivered on the concrete ship by R. J. Wig, of Philadelphia, now chief engineer, concrete ship division, Emergency Fleet Corporation. He reviewed the remarkable progress of this industry, and indicated that its permanency was probably assured. An interesting statement was to the effect that if the wooden ship is placed as 100 the relative weight of the concrete is 90 with the steel ship at 75. However he felt assured that a cement has been recently developed whereby a lighter ship can be constructed, probably bringing the ratio down from 90 to 77 or 80 as compared with the steel ship at 75. An idea of the amount of steel in a reinforced concrete ship was afforded by his statement that in a ship of 7500 tons dead weight, there was 800 tons of steel.

Dr. Henry M. Howe was the last speaker. He devoted himself to a spirited address on the war situation and our relation to it.

The Non-Ferrous Industry

Non-ferrous metals took up a large part of the Thursday morning session. The voluminous report of committee B 2 on non-ferrous metals and alloys was presented by the chairman, Prof. William Campbell, School of Mines, Columbia University. It covered 63 pages of printed matter. Some of the standards were discussed in this report and tentative specifications for white metal or bearing alloys were submitted. Under this head G. H. Clamer urged the use, so far as possible, of lead base bearing alloys to conserve the use of tin for other purposes during the war. Tentative methods for the analysis of gun metal and manganese bronze were offered.

A feature of this session was a topical discussion on "Season and Corrosion Cracking of Brass" participated in by Professor Campbell, W. H. Bassett, W. Reuben Webster, P. D. Merica, W. R. Woodward and W. B. Price.

New Officers

The officers elected for the ensuing year were as follows: President, G. H. Clamer, Ajax Metal Co., Philadelphia; vice-president, G. S. Webster, director, department of wharves, docks and ferries, Philadelphia; members of the executive committee, G. Aertsen, Midvale Steel & Ordnance Co., Philadelphia; Dr. George K. Burgess, chief department of metallurgy, Bureau of Standards, Washington; Dr. G. B. Heckel, editor *Drugs, Oils and Paints*, Philadelphia, and K. W. Zimmerschied, metallurgical engineer, General Motors Co., Detroit.

Koppers By-Product Ovens at Clairton Started

On Wednesday, June 25, the first coke was drawn at the new Koppers by-product coke plant of the Carnegie Steel Co. at Clairton, near Pittsburgh. This great plant, which contains 640 Koppers by-product ovens, will be completed in a short time. When the entire 640 ovens are in operation they will require annually 4,100,000 net tons of coal, from which it is expected to make 2,740,000 tons of furnace coke, 245,000 tons of coke breeze, 43,000 tons of sulphate of ammonia, 37,500,000 gal. of tar, 9,000,00 gal. of light oils and surplus oven gas at the rate of 60,000,000 cu. ft. per day. The coal for the plant will come from river mines of the H. C. Frick Coke Co. at its different coal-producing points above the ovens on the Monongahela River, the haul being about 47 miles. The coke to be made at this plant will be used at the Clairton, Duquesne and Edgar Thomson blast furnaces of the Carnegie Steel Co., numbering 24 stacks in all. These 24 stacks are closely situated to each other, and are connected by the Union Railroad, operated by the Carnegie Steel Co. This railroad has been extended to Clairton, to connect with the Clairton blast furnaces.

There is now under way at Clairton the building of a duplication of this plant to contain 640 ovens, and practically the same equipment as in the plant nearly completed. When these 640 ovens are finished the surplus coke, aside from that needed by the Clairton, Edgar Thomson and Duquesne furnaces, will be shipped by rail or river to blast furnaces of the Carnegie Steel Co. located on the Allegheny and Ohio rivers. These will include Isabella and Lucy furnaces at Pittsburgh, Edith on the North Side, and Neville Island stack at Neville Island. It is also likely part of the coke will go to Mingo Junction and Bellaire furnaces, a distance of about 95 miles from Clairton. It is expected at some future time to transport tar from the Clairton by-product coke plant to the mills of the Carnegie Steel Co. in the Pittsburgh district. Considering the great scarcity in supply of labor and the delays in securing equipment, the H. Koppers Co. made remarkably fast time in the building of this great coke plant. No time has been set for the completion of the second 640 ovens, but it is hoped to have them finished in the summer or fall of 1919.

The parties in interest request that the statement be made in this column that the proposed Republic Shipbuilding Corporation, to be located at Baltimore, will not be proceeded with and that therefore correspondence by manufacturers and others should be discontinued.

Steel May Be Shipped Without Priority

War Industries Board Advises that Shippers Are to Decide Many Distribution Questions — Economies in Consumption

WASHINGTON, July 2.—The possibility of stretching the steel supply by the cutting down of Government requirements not absolutely essential and the adoption of all possible economies is being carefully investigated by the War Industries Board and promises gratifying results. In addition, the Priorities Committee is working out a system for the allocation of steel to cover Government orders and the handling of priority certificates in the distribution of material to plants included in the standing preference list, the purpose being to provide as liberally as possible for consumers of any residue that may be left after war needs and the demands of other so-called essentials have been cared for. The general disposition of the War Industries Board is not only to deal as liberally as possible with steel consumers not entitled to priority but to facilitate the procurement of material by them whenever such deliveries will not interfere with the filling of orders covered by priority certificates.

Getting Some Deliveries Postponed

Acting upon the urgent requests of the Director of Steel Supply, supported by the leading members of the War Industries Board, the Government departments are carefully pruning their estimates, and are finding it practicable to defer deliveries on a considerable tonnage. No curtailment is proposed of the amounts of steel that will ultimately be needed for various purposes, but obviously any postponement of the time within which the steel in question must be delivered will serve to ease the situation to that extent.

The Shipping Board is co-operating heartily in this work and is developing a system for expediting the fabrication and transportation of plates and shapes that will ultimately cut down the amount of material moving between the steel works and the shipyards. The establishment of reservoirs or "banks" of plates in the steel shipyards is being very carefully supervised and such reserves will be standardized with a view to providing adequately for all yards without accumulating unnecessary material at any one point.

The Railroad Administration has abandoned the project of increasing materially the orders for steel rails heretofore placed by the railroads for delivery during the current year and requisitions for all other material will be held down to the lowest possible limits. While it has been found necessary to increase the rolling stock program by approximately 300 locomotives and 50,000 cars the types of the cars to be ordered will be those in the construction of which a minimum amount of steel is employed.

Economizing on Tool Steel

As indicative of the careful scrutiny now being given by the Railroad Administration of every detail of steel consumption a circular letter which has just been addressed to all railroad and terminal companies under Government control throughout the South is of special interest. This circular embodies a suggestion for the conservation of machine shop tool steel made by Regional Director B. L. Winchell, with headquarters at Atlanta, Ga., as follows:

To all Railroads and Terminal Companies Under Government Control—Southern Region:

With a view to conserving machine shop tool steel, the following suggestion is offered:

I believe one of the ways in which you can effect a great economy in machine shop supplies is to have a careful inventory taken of all of your tool steel. As a rule railroad shops are not very economical with this high-priced material. In one railroad shop that I had charge of I gathered together from various benches and out-of-the-way places enough tool steel to run the shop for nearly two years. I also found that few of the shops were making proper use of tool holders. An enormous economy can be effected by the introduction of tool holders in shops and the proper use of the same.

I show below list of the various firms who are manufacturing tool holders, viz.:

Armstrong Bros. Tool Co., 315 N. Francisco Ave., Chicago, Ill.
Bay State Tap & Die Co., Mansfield, Mass.
Clark Equipment Company (Celfor), Buchanan, Mich.
Gisholt Machine Co., Madison, Wis.
(Size of tool 5/8 in. square to 7/8 in. square)
Green Bay Drive Calk Co., Green Bay, Wis.
Lovejoy Tool Co., Inc., Springfield, Vt.
Pratt & Whitney Co., Hartford, Conn.
Ready Tool Co., Bridgeport, Conn.
Union Tool Co., Orange, Mass.
Western Tool & Mfg. Co., Springfield, Ohio.
Williams & Co., N. H., 35 Richards St., Brooklyn, N. Y.

This is not only a saving in the high-priced steel, etc., but also in the labor of grinding tools. I am confident it would pay you a thousand times over to employ a special man on this one item, having him visit the various shops and look over the expenditure for tool steel and the possibility of economy in various ways. At the present time when there is such a demand for alloy steel, a saving of this high grade steel would not only effect a great economy in your own Department but would be helpful in enabling the legitimate demands of munition factories and the manufacturers of war materials to be met promptly.

I am not recommending or suggesting any particular device. Details of this kind should be left entirely to the men you employ, or to the railroad officers themselves. I believe you would find enough steel in the various railroads in this country in stock or in their shops to run the railroads for the next several years with but very few additional purchases.

Officials of the Railroad Administration are decidedly impressed with the practicability of Mr. Winchell's suggestion, and it is understood that the distribution of the circular above quoted will be extended throughout all regional districts in which Government controlled railroad systems are operated.

Conservation in Furnace Manufacture

The Conservation Division of the War Industries Board is daily devising new methods for saving iron and steel, and has recently adopted programs designed to curtail the amount of metal required by manufacturers engaged in the production of furnaces and chains. In a letter to the furnace manufacturers a tentative program for conservation is set out as follows:

It is of first importance in the present emergency that the country's resources be used to full advantage and that we husband our supplies of materials, equipment and capital to aid in carrying on the war. The Conservation Division of the War Industries Board is making an inquiry to learn what savings the furnace manufacturing industry can effect and how the amount of capital invested in manufacturers' and dealers' stocks can be reduced.

The board has been informed that manufacturers in this industry are offering a greater variety of types, patterns and sizes of furnaces than is necessary in time of war, and that it would be entirely practicable to effect a reduction as a measure of conservation. By such a reduction and by restricting the making of certain types and sizes to but a few models, materials and equipment can be saved and the amount of capital invested in manufacturers and merchants' stocks substantially reduced. The elimination of the unnecessary use of steel and iron, which are urgently required for war purposes, is particularly desirable.

The program which has been drawn up is being submitted to each furnace manufacturer. A copy is inclosed. This program will be made effective unless substantial reasons are immediately presented to show that by some modification the needs of the Government can be met more effectually. If you have suggestions on this program whereby

greater economies can be brought about, we shall be glad to receive them.

The tentative program referred to is as follows:

1. The immediate discontinuance of the manufacture of new patterns for the duration of the war.

2. Each manufacturer to limit his line to not more than three styles of heaters, for the duration of the war. (Either cast or steel radiators may be used for each style if desired. Each so-called "pipeless" type to be included as one of the above three styles).

3. Each manufacturer to limit his line to not more than five sizes for each style of heater.

4. The manufacturer of firepot size of a rating less than 19 in. to be discontinued.

5. Pokers, scrapers, shovels, draft regulators and chains to be furnished only as extras.

Changes in Chain Manufacture

In the execution of its policy of cutting down styles and sizes of all articles manufactured of iron or steel with a view to conserving the output of the industry for war purposes, the Conservation Division is about to circularize manufacturers of chains with a questionnaire designed to develop the views of producers as to what can safely be eliminated. When the replies have been received from manufacturers dealers will be consulted, after which the Conservation Division will adopt a program that will be promulgated for the guidance of all producers. The questionnaire is as follows:

1. No. 3 Trace Chains: Shall the manufacture of these chains be eliminated?

2. Twist Link Traces: Shall the manufacture of all twist link traces be discontinued?

3. Length of Links: Shall these be manufactured in two lengths only, namely 8 and 10 links per ft. actual measurement and actual count?

4. Sizes of Trace Chains: Shall the manufacture of these chains be restricted to 3 sizes as follows:

(a) 5/16-in. or No. 0.

(b) 9/32-in. or No. 1.

(c) ¼-in. or No. 2.

5. Wrought "T" Hooks: Shall the manufacture of these hooks be eliminated?

6. Wrought "T" Bars: Shall the manufacture of these bars be eliminated?

7. Butt or Half Traces: Shall the manufacture of these traces be restricted to the same sizes and links per ft. as long traces and only in straight link, with bright or japanned finish?

8. Stage Traces—Regular or Buckeye Pattern: Shall the manufacture of stage traces, either straight or twisted link, smaller than No. 2, or shorter than 10 links to the foot, actual count, be eliminated?

9. Breast Chains—Single: Shall the manufacture of these chains in either straight or twist link be restricted to 8 and 10 links per ft., actual count, and made only of No. 0, No. 1, or No. 2 wire?

10. Breast Chains—Double Slack: Shall the manufacture of these chains be restricted to 2 patterns only, regular and heavy, and in 3 lengths only, namely 26 in., 28 in. and 30 in.?

11. Breast Chains—Patterns: Shall each manufacturer restrict his output of these breast chains to "Pennsylvania" type?

12. Hobble Chains: Shall the manufacture of these chains be restricted to "Coast" pattern in 10 in. lengths only?

13. Cart Back Chains: Shall each manufacturer restrict his output to one pattern only, either in 5/16-in. or ⅜-in. wire?

14. Heel Chains:

(a) Shall each manufacturer restrict his output to the No. 40, No. 45, and No. 50 chains in 4, 6, 8, and 10 links?

(b) Shall the manufacture of No. 99 chain be restricted to straight link only?

(c) Shall the manufacture of all No. 55 and No. 70 pattern, as well as all No. 3 size heel chains in every style be discontinued?

15. Well Chains: Shall each manufacturer restrict his output of these chains to No. 5 wire only?

16. Passing Link Chains: Shall each manufacturer restrict his output to 3 chains in the following sizes and links?

2/0 (No. 6 wire) 14 links per foot, actual measurement.

3/0 (No. 5 wire) 13 links per foot, actual measurement.

4/0 (No. 4 wire) 12 links per foot, actual measurement.

17. Repair Links: Shall the manufacture of these links be restricted to the following 3 sizes:

¼ in. (No. 2 wire) 10 links to the foot, actual measurement.

9/32 in. (No. 1 wire) 10 links to the foot, actual measurement.

5/16 in. (No. 0 wire) 8 links to the foot, actual measurement.

18. Lap Links: Shall the manufacture of lap links in 1¾ in. and 3½ in. lengths be discontinued?

19. C Links: Shall the manufacture of these links be restricted to one size, namely ½ x 2½ in.?

20. Lap Links: Shall each manufacturer restrict his output of these links to 6 numbers, 2, 2½, and 3 in. diameters in ½ and ⅝ in. wire?

21. Cow Ties: Shall each manufacturer restrict his output of these ties to straight link type and not less than 6 links per foot?

22. Finish: Shall all copper and bronze finishes for harness chains enumerated herein be eliminated?

23. Date of Enforcement: If the foregoing suggestions are adopted shall it be understood that no additional material for eliminated lines shall be ordered except to even up stocks in process of manufacture and that no chains of eliminated sizes shall be manufactured after Aug. 1, 1918?

As a number of representative manufacturers have already expressed themselves favorably with regard to the changes proposed by the Conservation Division it is probable that nearly all the modifications outlined will be finally adopted.

Steel Distribution May Be More Liberal Than Was Thought

In working out the plans for the allocation of steel for Government needs and the distribution of that covered by priority certificates and preference designation as well as the allotment of any residue remaining, the Priorities Committee has discovered at the outset that a general misunderstanding among steel consumers exists, due to a typographical error in the resolutions embodying the agreement between the War Industries Board and the American Iron and Steel Institute. There is a general misapprehension regarding the method to be employed in obtaining steel by establishments included in the preference list but holding no priority certificates. To correct this misunderstanding the committee has promulgated the following notice:

"To All Producers and Consumers of Iron and All Manufacturers and Consumers of Iron and Steel Products:

"In drafting the resolution adopted by the War Industries Board, dated June 6, 1918, embodying and adopting the agreement between the said board and the American Iron and Steel Institute, the following language was used:

"'No pig iron or steel manufactured products shall be shipped or delivered, except as follows:

"'(1) By priority certificates issued by the Priorities Division of the War Industries Board; or

"'(2) After orders covered by priority certificates shall have been provided for or filled, then producers of pig iron and of steel manufactured products may utilize such raw materials and manufacturing capacity, if any, as they may have available, to fill orders of their customers not covered by priority certificates, provided such orders are embraced within the schedule of purposes entitled to preference treatment as determined by the Priorities Board as follows:' (Here is given the schedule of purposes.)

"Through typographical error in transcribing the resolution the first clause in paragraph numbered (2) was made to read:

"'After priority certificates shall have been *issued for* or filled,' instead of

"'After orders covered by priority certificates shall have been *provided for* or filled,' as originally prepared and agreed to, as set out above.

"All outstanding copies of the resolution and agreement should be corrected accordingly.

"The purpose of the resolution is to permit deliveries of pig iron and of steel manufactured products under the schedule of purposes not only after orders covered by priority certificates shall have been filled, but at any time to the extent that such deliveries will not interfere with the filling when and as required of orders covered by priority certificates.

"If satisfactory delivery can be secured without

specific priority directions on orders embraced within the schedule of purposes entitled to preference treatment no application for a priority certificate need or should be made."

Necessity for Priority Certificates Overestimated

The steady increase in the number of priority orders outstanding and the widespread impression among steel consumers that even those industries included in the preference list can not obtain steel without certificates has induced the Priorities Committee, after consultation with the Director of Steel Supply, to prepare a letter, which is being sent to all applicants for priority certificates whose actual need thereof is at all in doubt. The committee wishes to restrict the use of certificates to cases of actual necessity and to leave manufacturers of iron and steel free to supply their customers' needs provided deliveries will not interfere with Government orders. This letter is as follows:

"1. Allocation of steel is undertaken by the director of steel supply only with reference to direct Government orders. All other orders must be placed by the concern desiring the steel. Deliveries will be made by the steel companies under the terms set out in the enclosed copy of a resolution of the War Industries Board of June 6 adopting an agreement of the steel manufacturers. It should be noted that deliveries of steel can be made for uses within the classification of purposes stated in the resolution, provided only that such deliveries will not interfere with orders actually covered by priority certificates. Inquiry should be made of the source of supply to ascertain if there will be a delay in delivery. If satisfactory delivery can be secured without priority assistance no application for a priority certificate should be made. If, however, it appears at any time that there will, without a priority certificate, be a serious delay in the delivery of material which is essential for use in war work or other work of exceptional importance, application for priority assistance should be made, using form P. C. 11.

"2. No blanket priority certificates are issued; only specific orders are classified according to their importance in war work or work otherwise of exceptional or national importance. See paragraph 31 of circular No. 3 enclosed herewith.

"3. There has been no classification of industries as non-essential. The classification of purposes referred to in paragraph 1 above is the only list at present having to do with preference in securing materials, and at the present time its use in this regard is limited to deliveries of steel. It serves as a guide to the steel companies with reference to such deliveries of steel as will not interfere with steel orders covered by priority certificates. This classification of purposes is the same as that embodied in the preference list issued by the Priorities Board. The preference list, however, at the present time applies only to the supply, distribution and transportation of coal and coke.

"4. With reference to material for replacement or maintenance of stock, priority is granted only when it is clearly shown that an urgent need exists for the maintenance of the particular stock for use in war work or other work of exceptional importance. The application must state in detail the nature of the intended uses of the materials and must embody an affidavit and guaranty that the materials will be used solely for such purposes. The application must cover specific orders for the materials desired, as no blanket certificates are issued. Application form P. C. 11 must be used."

Paragraph 31 of Circular No. 3, referred to in the above letter, provides as follows:

"31. No industry, plant, material, or commodity will be classified as such. Only specific orders for materials, commodities, or work are classified according to their importance in war preparation or in work necessary to the public interest and essential to the national welfare, or otherwise of exceptional importance."

No List of Non-Essential Industries

In view of constantly recurring reports to the effect that the War Industries Board is about to publish a list of non-essential industries which are to be denied steel, coal, etc., the Priorities Committee has revised the statement promulgated by it in connection with the adoption of preference list No. 1 and is giving to the revision the widest possible publicity. This statement is as follows:

The Priorities Board has adopted preference list No. 1 for the guidance of all Governmental agencies in the supply and in the distribution by rail or water of coal and coke. While the list speaks for itself, it is proper to say that the board has not undertaken to classify any industry as non-essential or at this time to limit the quantity of fuel which any particular industry or plant shall receive. The board has, however, listed certain industries whose operation is of exceptional importance, measured by the extent of their direct or indirect contribution either toward winning the war or toward promoting the national walfare, and these industries will be accorded preferential treatment by the Fuel Administration in the distribution of coal and coke, and also in the transportation of such coal and coke by the railroads.

Plan to Be Followed.—This same plan will be followed in according preferential treatment to war industries and plants in the transportation of raw materials and supplies required by them in their manufacturing operations, so that they may not be delayed or hampered in complying with priority orders issued against them governing their products.

Preference List No. 1 is not complete in itself, but it will be noted that provision is made for certifying additonal classes of industries and also individual plants whose operations are necessary as a war measure.

Two Factors to Control.—In determining what industries or plants are entitled to be certified, two factors will control: (1) The relative urgency of the uses or purposes for which the product of the plant utilized; and (2) the per cent of the product of the plant utilized in war work, direct or indirect, or work of exceptional or national importance. No plant, a very substantial per cent of whose product is not of exceptional importance, can be accorded preferential treatment.

At a recent conference participated in by representatives of nearly all the important bureaus now engaged in war work, the view was generally expressed that under no circumstances would it be necessary or advisable to issue a list definitely specifying the so-called non-essential industries. The policy heretofore pursued of giving preferential treatment to the war industries will be continued and will be relied upon, for the present at least, to take care of the situation. Agreements made by the Fuel Administration with non-war industries for the reduction of their coal supply will be promulgated from time to time as heretofore.—W. L. C.

Turbines for Troop Ships

Troop ships and freight carriers building by the Emergency Fleet Corporation are to have precedence in the turbine supply over naval vessels, according to the *Emergency Fleet News*. This is the assurance contained in a letter from Secretary Daniels to Chairman Hurley and made public by Charles Piez, vice-president of the Emergency Fleet Corporation, confirming an agreement entered into at a conference between the chiefs of the Bureau of Construction and Repair and of Steel Engineering, representing the Navy Department, and Naval Constructor Ackerson and Messrs. Cox and Brill, representing the Emergency Fleet Corporation.

Facilities at a Buffalo turbine shop now owned by the Navy Department will be put at the disposal of the Emergency Fleet Corporation without interfering with the turbine supply for destroyers until the entire shop is turned over to the Shipping Board, probably in October, when its whole output will be available for the corporation.

The Emergency Fleet Corporation had under construction a proposal to build its own turbine facilities had not other arrangements been made. This plan, however, would have meant a great reduplication of effort and caused considerable delay in the ship-building program.

Mr. Piez characterized the information coming from Secretary Daniels as the "best news" the Emergency Fleet Corporation has yet received.

Director General Schwab said: "The finest thing and most significant fact about Secretary Daniel's letter is the spirit of co-operation it evinces."

Westinghouse Plant at South Philadelphia

Interesting Features of Equipment of the Foundry and Forging Machine and Erecting Shops —The Seven Buildings of the Present Group

When the new plant of the Westinghouse Electric & Mfg. Co., South Philadelphia, reaches maximum production under present plans, which will be soon, at least one complete ship-propelling engine, consisting of turbine and condenser, will be turned out each working day. Although not strictly a war plant, having been started before the American declaration of war, the Westinghouse works will play a vital part in the war program, as its output will all go toward the equipment of ships built for the Emergency Fleet Corporation. The manufacturing layout which was described briefly in THE IRON AGE of May 16 is of a nature to lend itself to quantity production.

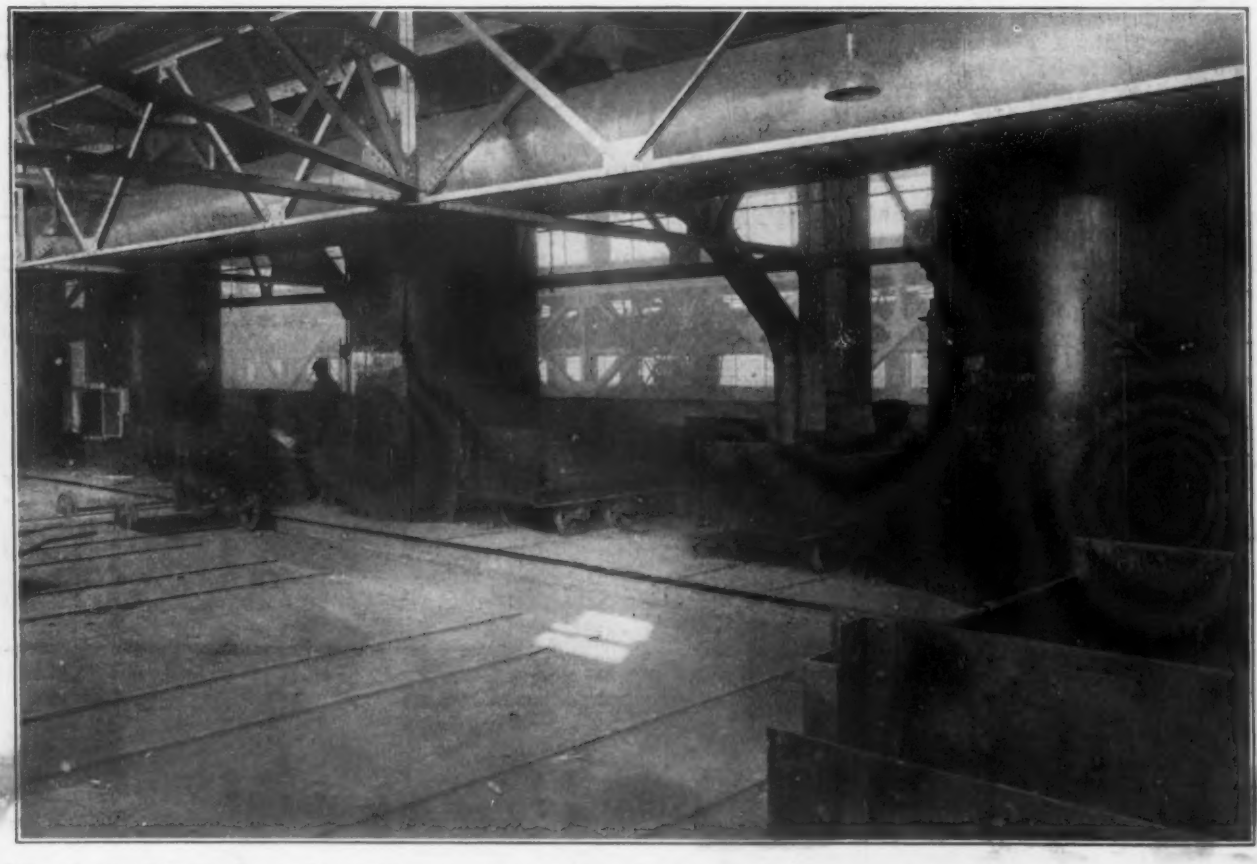
There are at present seven large buildings, comprising 600,000 sq. ft. of floor space, these buildings being the pattern and storage building, foundry, forge shop, power plant, two machine shops and an erecting shop. The pattern and storage building contains the main offices, dining room for officials and general foremen of departments, cafeteria for workmen of the foundry, photographic department, receiving and storage space for considerable raw material of various kinds. The pattern shops are kept clean of dust and dirt by a system of dust and shavings collection, by which this refuse is carried by suction into pipes and thence to an incinerator. By means of a damper in the piping some of the refuse can be deflected into a surplus shavings vault to be used for packing and other purposes.

The pattern and storage building is connected with the foundry by underground tunnels, through which foundry sand for cores and molds is carried from its storage space in the basement of the pattern and storage building by means of electric trucks to the foundry. Three hatchways in the center of the foundry floor are used to bring the loaded trucks up from the tunnels by means of the overhead cranes.

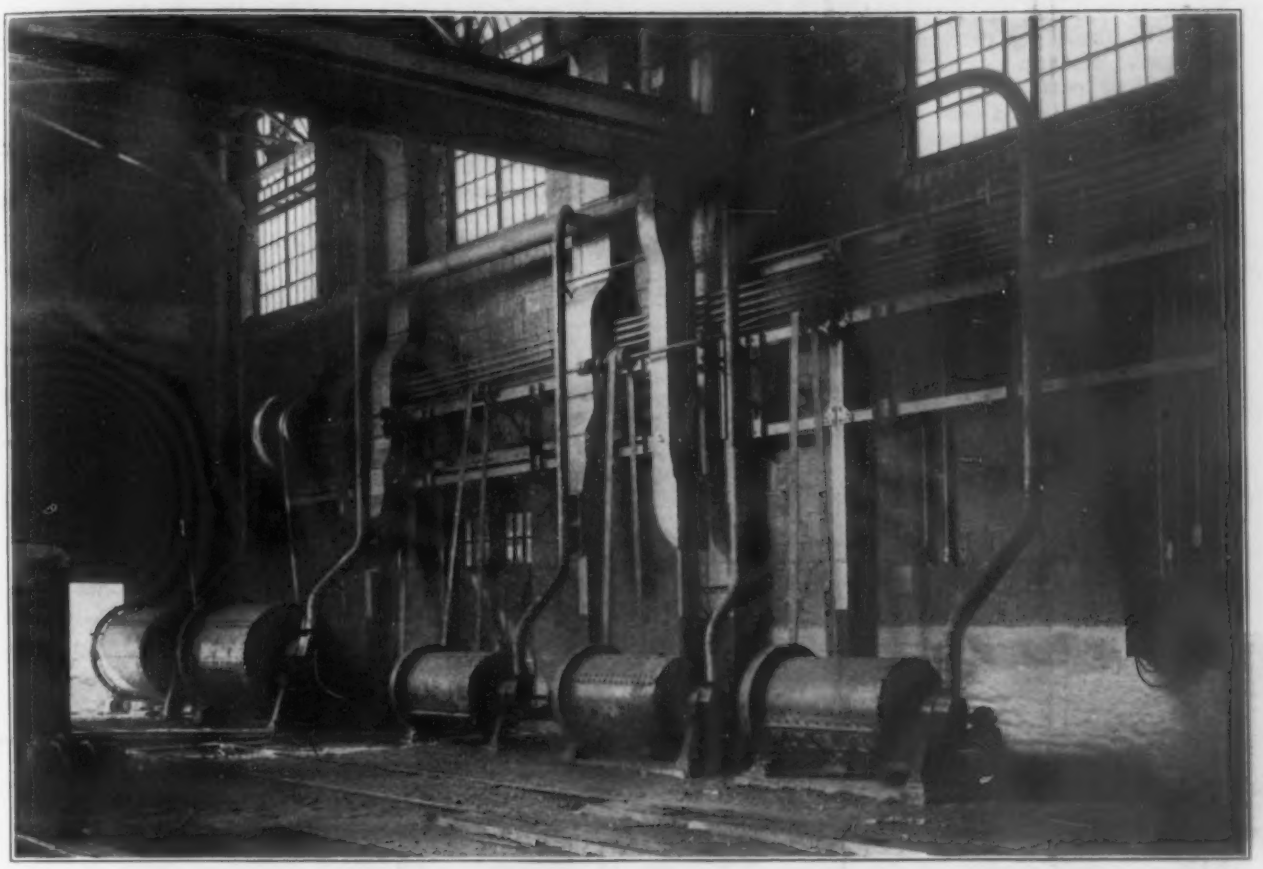
The Foundry

The foundry is 180 x 600 ft. in size. It contains three Whiting cupolas, two No. 9 and one No. 8, having a combined capacity of 180 to 200 tons a day. The charges are made up in the storage yard on trucks, delivered to the elevator and taken to the charging floor, where, by means of suitable trackage, the trucks are stored until required. In the event of a breakdown of both elevators the trucks may be hoisted by the storage yard crane to a platform on the outside of the building on a level with the charging floor. The two larger cupolas are equipped with Whiting charging machines. The loaded truck, having been placed on the charging table, is discharged into the cupola by the tilting of the table, compressed air being used for this operation. Each cupola is equipped with a Roots positive pressure No. 6½ blower.

There are three air furnaces, two of 40 tons and one of 15 tons capacity. They are charged from outside the building by a counter-weighted boom handled by the yard crane. The furnaces will melt scrap pieces weighing up to 15 or 20 tons. Should there be improper combustion for any reason, air from the Roots blowers may be utilized to bring the iron up to the desired temperature. For castings which require the greatest homogeneity the air furnaces are used in all cases in this plant. The iron after being melted down is puddled under the slag until it is thoroughly mixed.



The Cupolas Are Equipped with Whiting Charging Apparatus, Shown Here, the charges Being Made Up in the Yard on Trucks, Delivered to the Elevator and Taken to the Charging Floor, Where by Means of Suitable Trackage the Trucks Are Stored Until Required. The two large cupolas are equipped with self-charging apparatus, by which the truck, having been placed on the charging table, is discharging by the tilting of the table through the action of compressed air



A Section of the Foundry Showing the Rumbling System. The apparatus is connected with Sly suction pipes for the removal of the dust

Large concrete waterproof casting pits have been provided, these having large stirrups running from top to bottom and girders across the top for bolting down any large mold. Castings may be made up to 125 tons in weight.

The core department has 10 large core ovens and six small door-type ovens, all coke fired. The large ovens are equipped with Whiting electric car pullers, by means of which heavy molds that are placed in the ovens may be pulled in and out of the ovens without recourse to the cranes. Some of these cores weigh 50 tons apiece. The coke for the ovens is dumped from drop-bottom cars into the storage bins, from which it is fed to the ovens.

The brass foundry department consists of eight crucible furnaces and one Schwartz furnace. The brass department is entirely enclosed by wire fencing. The iron and brass cleaning departments, located at one end of the foundry, are each equipped with rumblers, grinders and sand blast rooms, which are connected by a suction system to Sly dust arresters.

The sand as it is dug out of the castings on the cleaning floor runs through a grating, thus keeping the floor clear. The grating prevents rods and coke from falling through, and these are forked off, while the sand drops into a pit and is loaded on storage battery trucks and returned to the storage bins in the basement of the pattern and storage building. These trucks are equipped with trays, which contain the sand, and by means of cranes may be lifted from the pits and taken to any part of the foundry.

The foundry crane equipment consists of two 50-ton and one 100-ton Morgan cranes in the main aisle, a number of 20-ton Toledo cranes in the side bays and six 5-ton Toledo wall cranes.

Adjacent to the foundry is a small building for an acetylene welding department. A track from the storage yard runs into this building and defective castings are carried there by an electric locomotive for welding. The foundry has a modern chemical and physical testing laboratory.

The storage yard for pig, scrap iron and coke is located on the cupola side of the foundry and is served by a 60-ton 100-ft. span Morgan crane running the full length of the building.

The Forging Shop

The forge department occupies a main building, 50 by 339 ft. and a leanto, 24 ft. wide, running the full length of the building. This department contains the foreman's office, wash room, lavatory, shower baths, gas producers, annealing furnaces and large billet and ingot heating furnaces. The main building is served by two 20-ton and one 30-ton Toledo cranes.

The equipment for large forging consists of a 1000-ton steam hydraulic press, which is served with ingots from two producer-gas-fired open-hearth regenerative type furnaces, 8 x 14 ft. It is also served by a 30-ton overhead crane, carrying on the main hoist a 30-ton capacity motor actuated turning device controlled by the crane operator. The press has a piston stroke of 48 in. and is capable of handling 35-in. ingots and weighing 46,000 lbs. It was built by the United Engineering & Foundry Co., Pittsburgh. A 300-ton press of the same type and make as the larger one handles ingots up to 24 in. and is served by a 5 x 10-ft. producer-gas regenerative furnace and a 20-ton overhead crane.

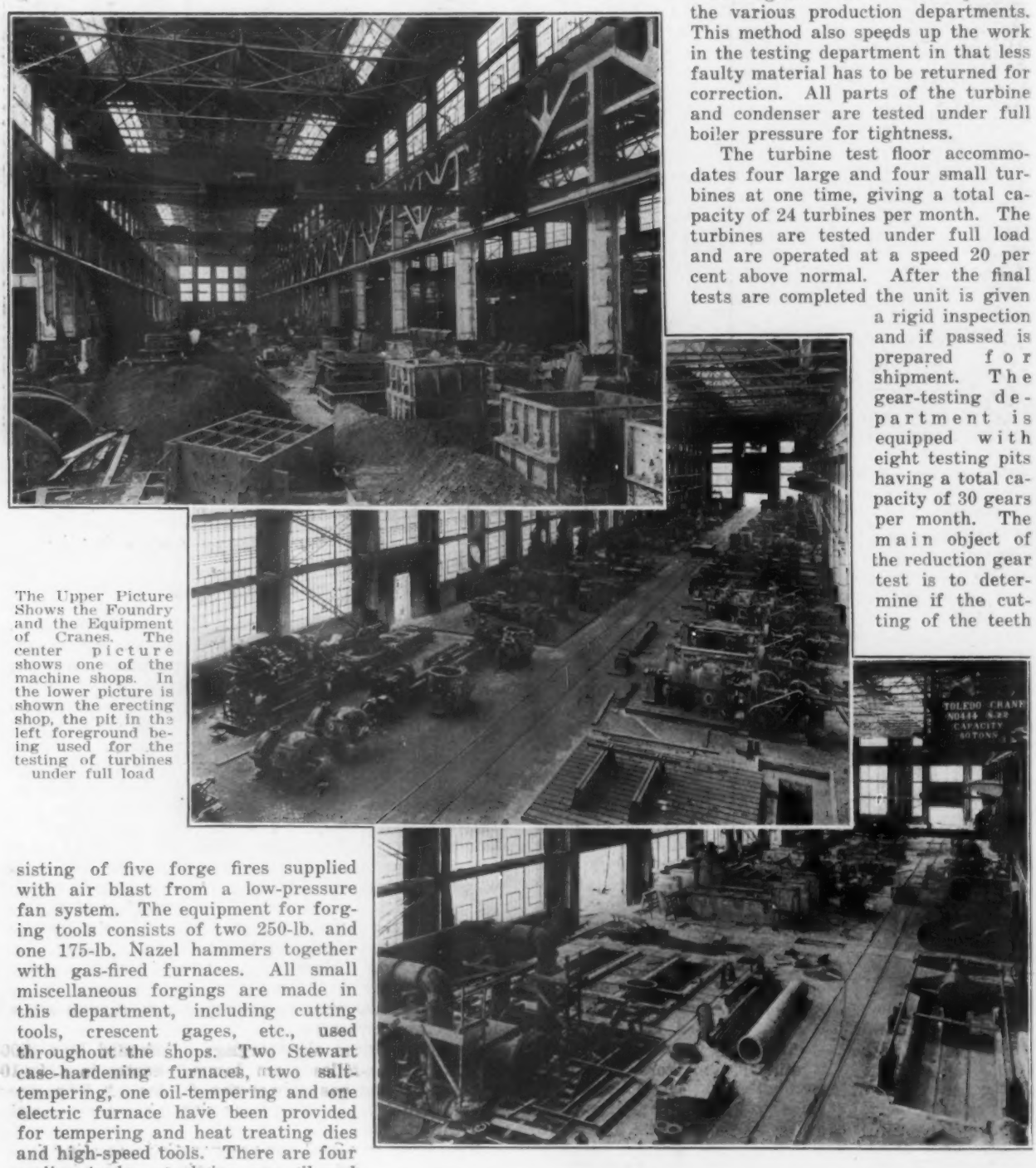
Medium sized forgings are handled by a 1500-lb. Bement-Miles steam hammer, heated in a 5 x 10-ft. producer-gas regenerative furnace. A 5-ton capacity electric hoist carried by a swinging jib crane is used with the hammer.

Two large gas-fired non-regenerative annealing furnaces are provided for heat treating the forgings as they come back from the presses and again after they are rough machined. These furnaces are 7 x 22½ ft. and 6 ft. high inside. Each furnace is provided with a firebrick covered truck, which runs on tracks extending across the main shop floor, permitting the full length of the truck to be withdrawn from the furnace and thus making it convenient for the overhead crane to handle the forging.

Opposite the front end of the annealing furnaces is an oil-quenching tank, 5 x 20 ft., for tempering gear shafts and other large forgings.

Three Swindell straight up-draft water-sealed-bottom bituminous gas producers furnish the gas to the furnaces. Each producer has an hourly capacity of 800 lbs. of coal. The hot gas is distributed as it comes from the producers through a brick-lined overhead flue to the large annealing and regenerative furnaces above referred to. Coal is conveyed from a separate bunker in the power house to the gas-producer bunker by means of a hand-operated car running on an overhead track.

In addition to the capacity for large forgings, the forge shop has miscellaneous hand-forge equipment consisting of five forge fires supplied with air blast from a low-pressure fan system. The equipment for forging tools consists of two 250-lb. and one 175-lb. Nazel hammers together with gas-fired furnaces. All small miscellaneous forgings are made in this department, including cutting tools, crescent gages, etc., used throughout the shops. Two Stewart case-hardening furnaces, two salt-tempering, one oil-tempering and one electric furnace have been provided for tempering and heat treating dies and high-speed tools. There are four cooling tanks, one brine, one oil and two water. Other equipment consists of bolt forging machines.



The Upper Picture Shows the Foundry and the Equipment of Cranes. The center picture shows one of the machine shops. In the lower picture is shown the erecting shop, the pit in the left foreground being used for the testing of turbines under full load

Machine and Erecting Shops

Forgings and castings go to the machine shops for machine operations. The plan of the works is to set the machine tools up in such a manner so that there is a minimum of handling in performing the various operations. The shops are arranged so that the forgings, castings and other material can be sent direct to the machine shops or can be stored in the yard between the machine shops. From this storage yard the rough material can be quickly carried to the various machines by means of many doors and tracks. A standard gage track runs through each building and a number of electric locomotives are used to haul the material to and from the several departments.

One of the machine shops is used exclusively for turbines and reduction gears and the other exclusively for condensers. These two shops and the erecting shop are connected, the erecting shop extending across the end of both machine shops diagonally.

All material going to the erecting and testing shop is first tested in its own department to insure a maximum degree of care on the part of the various production departments. This method also speeds up the work in the testing department in that less faulty material has to be returned for correction. All parts of the turbine and condenser are tested under full boiler pressure for tightness.

The turbine test floor accommodates four large and four small turbines at one time, giving a total capacity of 24 turbines per month. The turbines are tested under full load and are operated at a speed 20 per cent above normal. After the final tests are completed the unit is given a rigid inspection and if passed is prepared for shipment. The gear-testing department is equipped with eight testing pits having a total capacity of 30 gears per month. The main object of the reduction gear test is to determine if the cutting of the teeth and the alignment of the gears is sufficiently accurate ing of manufacturing operations.

The whole plant was laid out with a noteworthy regard for the health and comfort of the workers, some of the buildings being provided with shower baths, and all of them having toilets, wash rooms, lunch rooms, etc. The sides of all buildings are almost entirely of glass, and a flood of natural illumination is thus afforded.

A particular feature of the layout is the susceptibility of the plant to enlargement without any retarding of manufacturing operations.

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Electric Cast-Steel Anchor Chain*

New Type of Chain and How It Is Made—Special Electric Steel with High Elastic Limit—New Product's History

BY H. JASPER COX

WROUGHT-IRON chain, either hand or steam-hammer welded, has been used almost exclusively in ships to this day. Mild steel chain has been tried, but has so far proved either too ductile to retain its form under stress or too hard to insure reliable welds.

General Electric Co.'s Experiments

In their first attempt to make cast-steel chain, the General Electric Co. used electric furnace steel, adopting the die casting process with metal molds. The links produced were perfectly sound and of good finish, but it was not found practicable to develop this process for commercial production for the following reasons:

It was necessary to open the mold at a very critical time, while the metal was congealing; if left for a few seconds longer the links break due to the core being solid.

If the mold was opened too quickly, the link being in a plastic state tended to deform.

They then made a considerable amount of chain using sand molds and cores, experimented with heat treatment and photomicrographs, and eventually obtained links which pulled at from 60 to 100 per cent above wrought-iron chain. The first of these links were tested at the Bureau of Standards and some further samples were tested at a later date at the Charleston Navy Yard. In the latter tests six cast-steel links 2 in. in diameter were used; three of the links had been annealed at 850 deg. C. and cooled in the furnace, and three links had been heated to 850 deg. C. and quenched in water.

The links were tested in an 800,000-lb. chain testing machine with the following average results:

Average of 3 Links	Breaking Strength, Lb.	Total Stretch, In.
Annealed	324,083	1 3/16
Quenched	329,750	1¼

Note.—The breaking test for a 2-in. wrought iron chain is 225,792 lb.

Before testing, each link was subjected to a proof stress of 145,400 lb. and none of the links showed a measurable elongation. The diameter was slightly less than 2 in. and the original length 11 13/16 in.

The chemical analysis made from composite drillings taken from the links were:

	Carbon	Manganese	Phosphorus	Sulphur	Silicon
Annealed links, per cent..	0.32	0.55	0.034	0.025	0.14
Quenched links, per cent..	0.35	0.68	0.027	0.026	0.15

The general conclusions from these tests were that the quenched link was somewhat superior to the annealed link and that the yield point of both was much in excess of that of wrought iron. In all these links the stud was cast in.

Following this a series of comparative percussion and bend tests were carried out on separate links of cast steel and wrought iron. The general conclusion from these tests was that they had little relative value, or did not duplicate conditions met with in service.

National Malleable Castings Co.'s Experiments

At this time the subject was brought to the attention of the National Malleable Castings Co. of Cleveland, which immediately saw the resemblance between the problems of cast-steel anchor chain and car coupler knuckles.

After exhaustive tests and experiments some years ago this company had developed a special electric steel which combined with a high tensile strength a remarkable ability to withstand shock without distortion. This material they called Naco steel. They were invited to participate in the further development of cast-steel chain and prepared samples of 1⅜, 2, 2¼ and 2⅞-in. chain, including both couplets of the common link of each size and the end combinations of special links and shackles. These samples were made of Naco steel and were tested on March 1 and 2, 1918, at their Sharon plant. Briefly, the results may be summarized as follows:

A total of 17 static tests and 8 dynamic tests were made. The static tests covered the sizes of chain above mentioned, and were largely upon Naco cast-steel chain only. The dynamic tests covered the 2-in. chain only, and included samples of commercial wrought-iron chain, chain from the Charleston Navy Yard, and Naco cast-steel chain. The primary purpose of these tests was to demonstrate that the Naco cast steel, when put into chain and properly heat-treated, would not only give static tensile results in excess of present specified breaking loads on wrought chain, but would withstand suddenly applied shock stresses better than wrought-iron chains of corresponding sizes.

Of the four different sizes of Naco chain tested statically, the 1⅜-in. chain showed an average breaking load about 73 per cent above the specified breaking load of wrought chain, the 2-in. chain showed 86 per cent, the 2¼-in. showed 75 per cent, and the 2⅞-in. showed 77 per cent, or an average improvement of about 78 per cent.

In the dynamic tests, consisting of tensile shock tests applied through a Master Car Builders' drop testing machine to short sample pieces of chain, the 2-in. commercial wrought-iron chain in three tests averaged 142,680 ft.-lb., the Navy Yard wrought chain in two tests averaged 623,200 ft.-lb., and the Naco test steel chain in three tests averaged 1,902,400 ft.-lb. These figures do not indicate the number of foot pounds of energy actually absorbed by each type of chain, as some of the energy was dissipated in other ways; but they may be considered as a comparative basis for determining the relative shock absorbing capacity of the different chains. Using the figure 1 as the basis for commercial wrought-iron chain, the Navy Yard chain showed 4.3 times, and the Naco cast-steel chain 13.2 times as much capacity for resisting a jerk shock of this nature.

The general conclusion from these tests was that Naco cast-steel chain not only fulfilled all the requirements of a good anchor chain but was superior to welded wrought-iron chain. The Committee of Lloyd's Register of Shipping immediately sanctioned the use of this chain on classed vessels and the Emergency Fleet Corporation has ordered a considerable quantity for their new tonnage.

Molding and Casting Links

A number of successful molding and casting methods have been tried, by some of which alternate links are precast and inserted in the molds before casting the connecting links; in others all links may be cast at one time; while other methods again are adaptable to either.

A good deal of controversy has arisen regarding the respective merits of gating on the stud or on the side of the link, but it may be said that good links have been produced by either. The stud being the least important part of the link, any defect caused at the gate is not of the same importance as it would be on the side.

It is considered most desirable that only dry sand

*From a paper presented at the twenty-first annual meeting of the American Society for Testing Materials, Atlantic City, N. J., June 26. The author is Lloyds Surveyor, New York.

molds and cores be used, in order to avoid as far as possible the tendency of piping in the casting, especially in the smaller links.

Heat Treatment

The Naco cast-steel links were subjected to the same heat treatment as Naco car coupler knuckles. In this treatment the links were placed on a traveler and slowly passed through a heating furnace in which the desired heat is automatically controlled by special contracting pyrometers. At the discharge end of this furnace the links are dropped into a quenching tank of water and after quenching are slowly passed through a drawing furnace on a second traveler.

For the treatment of complete lengths of 15 fathoms of cable modifications in the arrangements of these furnaces and quenching tanks will of course have to be made, but it is understood that this has already been worked out by the National Malleable Castings Co.

Specifications

Following the first series of tests at Sharon, Lloyd's Register of Shipping prepared specifications of requirements for electric cast-steel anchor chain intended to be used in classed vessels, and these specifications with some slight revision have been submitted to committee A-1 on steel of the American Society for Testing Materials.

It was not considered desirable to lay down any specific requirements with regard to manufacture, but to commence with it was thought necessary to limit the application to the electric furnace process, to require the use of dry sand molds or cores, and to subject the chain to a heat treatment.

With regard to the physical tests, it was decided to take advantage of the higher tensile strength easily obtained in cast steel, and to specify a proof load equal to the present breaking load of wrought-iron chain and breaking load of 40 per cent in excess of the present breaking load. This provided a considerable margin of safety at little or no sacrifice, since owing to the importance of weight as a factor in anchor chain it was not permissible to make a corresponding reduction in the diameter.

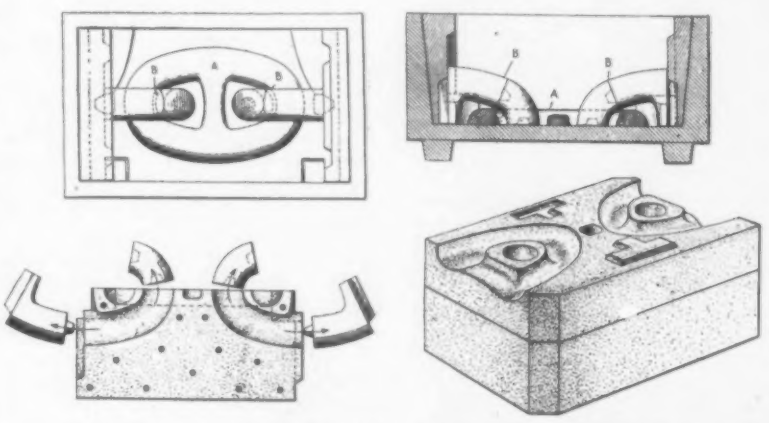
Sufficient data were not at hand to specify shock tests for all sizes of cable, nor was it considered necessary in the present state of the development to insist on any particular form of shock test for general application. It was therefore decided to cover this test in a general manner in the specifications, such that the classification societies may specify any particular crucial or commercial test considered necessary to determine the shock resisting qualities of the material.

In the case of the chain to be made by the National Malleable Castings Co., test pieces from each shot of chain manufactured will for the present be subjected to an M C. B. drop test based on the average results obtained with good wrought-iron chain of similar size.

Some Experiments with Cast Steel Chain*

BY CHESTER K. BROOKS

SEVERAL months ago, when the National Malleable Castings Co. was invited to participate in the experimental development of cast-steel chain, the first problem which required attention was the working out of suitable foundry methods for producing chain links in sand molds, and uniting them into continuous lengths of chain. A number of entirely successful equipments for making the molds was the result, some of which are shown in the illustration.



Illustrating First Method of Making Molds for Cast-Steel Chain

Connecting up the links into chain was accomplished in either of two ways: (1) the continuous process, in which the entire chain is poured from one heat, into previously prepared and united molds, by filling one interlinked mold impression after another; and (2) the pre-cast link process, in which half the links comprising a complete length of chain are cast separately, shaken out, cleaned, inspected, and made ready for incorporation into the finished chain. Subsequently, these links are placed in mold cavities and coupled up into continuous chain by pouring metal into other molds containing impressions for similar links, interlinked with the pre-cast links. Any of the illustrated methods of making molds is equally applicable to the continuous process or the pre-cast link process of making chain.

Another part of the foundry problem was the character of the mold. Recognizing the vital importance of sound castings in a product of this character, we came to the conclusion quite early in our experiments that all of the links should be produced in dry sand molds. The methods of application of gates and risers have also required some study, the details of which need hardly be set forth here. Suffice it to say that we have been able to secure very excellent results both in pouring through the stud and through the side of the link.

The character of the metal used by us in these experiments, and its handling in the heat treatment, have been touched upon in the paper by Mr. Cox. In our preparations for manufacture, the adaptation of the method of heat treatment used for our car coupler knuckles to 90 ft. shots of chain has involved some problems, but these have been solved and the process will be practically identical in method and results.

Referring now to the results of physical tests on cast-steel stud chain of our Naco steel, we felt that the testing facilities at our Sharon, Pa., steel castings plant, used principally in the manufacture of car couplers, were very well suited for the carrying out of the further tests which seemed desirable after the last experiments at Schenectady. Our suggestion having been accepted, we made plans to have ready as many different sizes of cast chain as possible in the short time available, and succeeded in preparing short lengths of 1⅜, 2, 2¼ and 2⅞-in. Naco cast-steel chain, ready for test on March 1 and 2, 1918, at our Sharon plant.

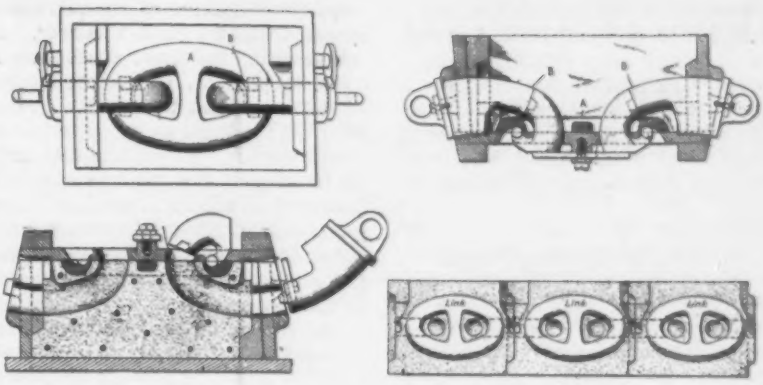
Testing the Chain

The tests were conducted on a vertical screw type static testing machine of 1,000,000-lb. capacity and a standard Master Car Builders' drop testing machine. The chains subjected to static tension tests were supported by coupling each end link of the test chain to the crosshead of the static testing machine by means of a testing shackle and pin.

Test chains consisting of five common stud or A links were subjected to a light load sufficient to reduce

*From a discussion of Mr. Cox's paper reviewed in the foregoing. The author is with the National Malleable Castings Co., Cleveland.

high bearing spots between adjacent links, which was then released and a measurement over the three middle links laid off. The elongation over this measurement was then taken at loads corresponding to the proof load, the breaking load, and the breaking load plus 40 per cent, as specified by the Ship Classification Societies for the corresponding sizes of wrought chain. After these three loads had been applied, released, and elongation measured, a load to destruction was then applied.



Illustrating Second Method of Making Molds for Cast-Steel Chain

Test chains consisting of two sections of A, B and E links coupled with shackle D were tested in the same manner, except that the elongation measurement was taken over the two B links. The 2⅞-in. chain consisted of one each of the A, B and E links and the elongation was measured on the B link only.

The test chains used in the drop testing machine were all of the 2-in. size and consisted of five stud or A links each. These chains were installed in the testing machine by connecting the upper link in a shackle bar and the lower link in an equalizer shackle by means of shackle pins passing through the eye of each link. This arrangement is such that a part of the energy of the falling weight is transmitted to the test chain as a dynamic tensile stress. The over-all measurement of the middle three links of these test chains was laid off as in the static tests and the elongation measured after the third blow from each of the specified heights. The weight of the tup was 1640 lb. and this weight was allowed to rest upon the equalizer when readings were laid out and elongation measured. In all these tests the numbering of the links was upward, commencing with the bottom link as No. 1.

Table 1 shows the results of all the static tension tests and Table 2 the results of the dynamic tension tests. Included among the dynamic tests are not only the tests of 2-in. Naco steel chain, but also certain tests on the same size specimens of commercial wrought-iron chain, and samples from the Boston Navy Yard.

Comparison with Car Couplers

Before bringing this paper to a close we feel that some reference should be made to our experience in the railroad car coupler field during the past 20 years, for the reason that that experience has made possible the accomplishment of results in the cast-steel chain problem in a few weeks which otherwise would have taken several years to attain.

As you are probably aware, the knuckle of the Master Car Builders' vertical plane type of coupler has involved a very serious and difficult problem, particularly in the past 10 years. Since the adoption of the Standard Master Car Builders' contour for that coupler in the early '90's—a standard which, because of the requirements of interchangeability, has remained substantially without change up to the present time—there have been enormous increases in locomotive tractive effort, size and weight of car equipment, and tonnage hauled per train. The limitations of the Master Car Builders' contour, formed partly by the coupler head and partly by the knuckle, have imposed certain fixed dimensions upon the size of the hub of the knuckle—its weakest point—which have effectually barred any substantial increase in section.

The stress to which this hub section is subjected is really enormous, for the knuckle, which is in the form of a hook pivoted at its middle, transmits not only the entire tractive effort of the locomotive in pulling the train, but also receives shocks of great suddenness and intensity, both jerks and buffs, due to the surging of trains, the running out and in of "slack" during application and release of brakes, and in coupling by impact. Dynamometer car records have shown time and again that these pulls and buffs are frequently many times in excess of the tractive effort of the largest modern locomotives.

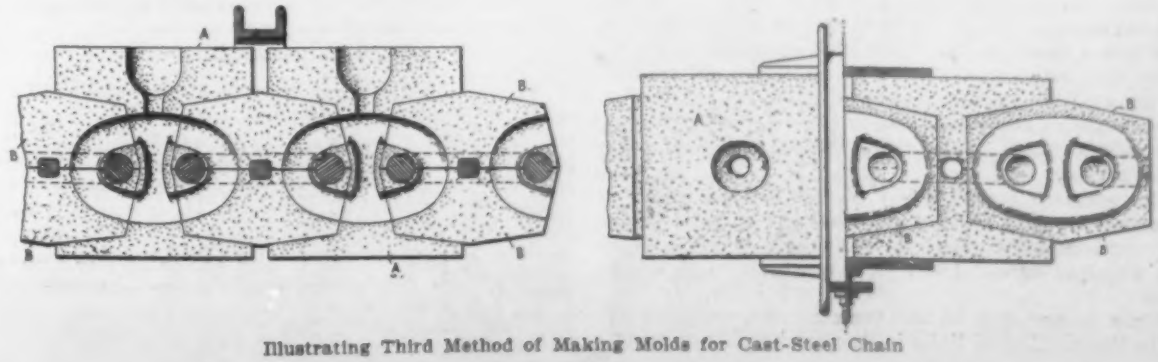
From the locomotive pilot to the caboose there is no other part of the railroad equipment subjected to more severe or frequent shock than the knuckle; no part which it is more essential to maintain as nearly as possible in its original form without distortion; and no part more strictly surrounded by conditions which limit possible changes of design for increasing its strength.

The Kind of Steel Needed

Notwithstanding the evil effects of knuckle distortion upon proper maintenance of contour, it has been felt for years that nothing but a material with high ductility would be capable of receiving these severe shock stresses. Part of the basis for this feeling has been the theory that a very ductile material would, by its elongation, absorb some of the shock and so save itself from rupture; but the difficulty with this is that the major part of this elongation is available only after the elastic limit of the material has been passed.

Two possible solutions for this problem have presented themselves: first, the use of a special material with very much higher capacity to resist both static and dynamic stresses, and second, the adoption of an entirely new and heavier coupler with modified contour, having sufficient sectional areas to make resort to special materials unnecessary.

In the meantime, realizing the importance of the problem, and the probable length of time involved in developing a standard coupler, we began an exhaustive search for a suitable special material to use in our knuckles. In the early days we started making couplers by the acid open-hearth process, later changing to basic, but our experience with both these steels led us



Illustrating Third Method of Making Molds for Cast-Steel Chain

to believe that there was no possibility of increasing the tensile strength sufficiently without loss of ability to withstand shock which would only result in failure to withstand the required Master Car Builders' tests, which tended to compel the use of a very soft material. We then began a series of experiments in the electric furnace with high-carbon steels heat-treated, and later with alloy steels. Marked improvements in tensile strength were the result, but the ability to withstand shock did not increase, and in many cases was diminished.

Table 1—Static Tension Tests of Naco Steel Chain

Size, In.	Weight of Test Chain, Lb.	Elongation, In., After Proof Load.	After Breaking Load	After Breaking Load Plus 40 per Cent	Load at Rupture, Lb.	Remarks
1⅜	40	0.03	0.04	0.08	213,600	Broke No. 3 link. Section of metal solid.
1⅜	40	0.03	0.04	0.07	198,700	Broke No. 3 link. Section of metal few small blow holes.
1⅜	40	0.02	0.04	0.09	180,700	Broke No. 3 link. Section of metal honeycombed.
2	123	0.03	0.06	0.13	456,400	Broke No. 4 link. Small shrinkage in each fracture.
2	122	0.03	0.06	0.09	400,000	Broke No. 3 link. Section shows solid.
2	122	0.03	0.05	0.10	403,000	Broke No. 4 link. Section shows solid.
2	225	0.20	0.27	0.45	381,900	Broke top E link. Section shows few small blow holes.
2	223	0.10	0.22	0.63	346,500	Broke bottom E link. Section shows few small blow holes.
2	223	0.07	0.14	*	316,100	Broke bottom E link. Section shows few small blow holes.
2¼	174	0.05	0.09	0.20	494,400	Broke No. 1 link. Section shows solid.
2¼	174	0.07	0.13	0.33	495,400	Broke No. 3 link. Section shows solid.
2¼	175	0.06	0.11	0.22	513,200	Broke No. 5 link. Section shows solid.
2¼	172	0.02	0.05	0.14	502,400	Broke No. 3 link. Fractured through defect.
2¼	171	0.03	0.07	0.16	491,900	Broke No. 5 link. No. 3 link defective.
2	...	0.65	0.65	0.67	452,700	Broke No. 2 link. Section shows solid. See also dynamic test No. 4.
2⅞	251	0.00	0.00	0.00	764,700	Broke E link. Section shows few blow holes in one side.
2	...	0.72	0.73	0.74	467,400	Broke No. 3 link. Section shows small shrinkage one side. See also dynamic test No. 8.

*Not obtainable.

High Elastic Limit of Naco Steel

Finally we arrived at a special material to which we later gave the name "Naco" steel, which combined with a high tensile strength a very extraordinary ability to withstand shock. This material, now used in our coupler knuckles, has raised their elastic limit more than 225 per cent, and their ability to resist shock stresses nearly 100 per cent over ordinary open-hearth steel. The amount of shock which these Naco knuckles will take without breakage or serious distortion is beyond anything in our experience, and we have been able to develop a specification of our own, along the lines of Master Car Builders' coupler specifications, but calling for only half the amount of knuckle distortion with the same amount of shock in the drop test—a feature of the greatest advantage in the maintenance of proper contour in service.

There are so many points of resemblance between the coupler-knuckle problem and that of cast-steel chain as we understand it that we were able to start at a point which otherwise must have taken years of study and development, with the results set forth. In our opinion, a proper specification for cast-steel chain would require the making of links in dry sand molds or cores, but other details of manufacture should be left optional with the manufacturer. For the chemical requirements, the steel should be made by the electric furnace process, with phosphorus and sulphur limits of not over 0.04 per cent. The physical requirements should be sufficiently rigid to insure sound material and should embody a dynamic test sufficiently severe to put the ability of the steel to withstand shock beyond any question of doubt. For this latter purpose we believe the standard Master Car Builder's drop testing machine presents the most readily available commercial machine, and a shock test on short pieces of test chain similar to the tests carried out at our Sharon plant seems to be as closely representative of the service to which anchor chain is subjected as any laboratory test can be.

W. L. Merrill of the General Electric Co., Schenectady, N. Y., in discussing Mr. Cox's paper, called attention to the fact that it is probably the case that "no impact stress great enough to cause failure of the Naco chain will ever occur in service; hence the shortness of Naco steel is not a disadvantage in anchor chain, while the stiffness is an enormous gain."

Definitions of Compressed Air Terms

Upon the recommendation of its technical committee the Compressed Air Society, 30 Church Street, New York, has adopted the following definitions of certain compressed air terms, in order to eliminate confusion as to their exact meaning.

Displacement.—The displacement of an air compressor is the volume displacement by the net area of the compressor piston.

Capacity.—The capacity should be expressed in cubic feet per minute and is the actual amount of air compressed and delivered, expressed in free air at intake temperature and at the pressure of dry air at the suction.

Volumetric Efficiency.—Volumetric efficiency is the ratio of the capacity to the displacement of the compressor, all as defined above.

Compression Efficiency.—Compression efficiency is the ratio of the work required to compress isothermally all the air delivered by an air compressor to the work actually done within the compressor cylinder as shown by indicator cards, and may be expressed as the product of the volumetric efficiency, the intake pressure and the hyperbolic logarithm of the ratio of compression, all divided by the indicated mean effective pressure within the air cylinder or cylinders.

Mechanical Efficiency.—Mechanical efficiency is the ratio of the air indicated horsepower to the steam indicated horsepower, in the case of a steam-driven, and to the brake horsepower, in the case of a power-driven machine.

Overall Efficiency.—Overall efficiency is the product of the compression efficiency and the mechanical efficiency.

The society further recommends that the use of other expressions of efficiency be discontinued.

The officers of the Compressed Air Society are as follows: President, W. P. Pressinger, Chicago Pneumatic Tool Co.; first vice-president, F. H. Jones, Worthington Pump & Machinery Corporation; second vice-president, G. L. Brunner, Brunner Mfg. Co.; treasurer, J. W. Wall, Gardner Governor Co., and secretary, L. D. Albin, Ingersoll-Rand Co.

The Buckley Brothers Co., manufacturer and importer, Fifth Avenue and Nineteenth Street, New York, has instituted a savings plan by which each employee is to be given free of charge one thrift stamp every time she or he has purchased three. The company has appointed a custodian who keeps charge of the cards, which are at all times the property of the employees, and are to be delivered to any owner at any time on demand. By this arrangement every employee may secure one $5 War Saving Certificate Stamp when every $3 worth of thrift stamps has been accumulated.

Large Profits Made by Many Companies

Federal Trade Commission Gives Results of Its Investigations to Guide Congress in Framing a Revenue Bill—The Price Fixing Policy

WASHINGTON, July 2.—A voluminous report upon the extraordinary gains made by many corporations has been made to the Senate by the Federal Trade Commission in response to a resolution recently adopted calling for "all facts, figures, data or information now in possession of the Federal Trade Commission relative to profiteering which would in any way enable Congress to deal with the matter either through the present proposed resolution or through enactment of more effective criminal statutes." The report of the commission deals with numerous industries, but the principal chapters are devoted to the profits of millers, meat packers, and manufacturers of steel, copper, zinc and nickel. An interesting disclosure in this connection is the fact that certain mills which start with steel furnaces and therefore are not fully integrated and which have made objection that the Government prices are too low for them show returns on investment as figured by the commission ranging from 40 to 319 per cent on the business of 1917.

It is an open secret here that the commission has hastened the presentation of this report because of the desire of the congressional leaders to secure the information in time to be of use in connection with the framing of the revenue bill in which an excess profits tax provision will be embraced designed to obtain a maximum contribution from every prosperous corporation regardless of the character of its organization or the relation of its current profits to those of the so-called pre-war period.

Sources of Information

The commission states at the outset that its information concerning the present range of profits in various industries arises from three activities: First, cost-finding by the commission for the War Industries Board, the Food Administration, the Fuel Administration and other executive departments which have called upon the commission for this work; second, industrial surveys undertaken by the commission at the direction of the President or upon its own initiative; and third, enforcement of the law against unfair methods of competition.

Under the first activity, the commission has had recent view of many industries handling basic materials including steel, copper, zinc, nickel, coal, and petroleum and its products. Under the second activity the commission has recently dealt with food products. Under the third activity the commission has daily contact with the tendencies of trade as they are revealed through numerous complaints filed with it for the application of remedies which are statutorily invested in the commission.

The outstanding revelation which accompanies the work of cost-finding is the heavy profit made by the low-cost concern under a governmental fixed price for the whole country. The outstanding feature on the score of profit revealed in the regular work of the commission under the statute creating it and the Clayton act, is the trade tendency to increase and to maintain prices against the forces of competition.

Greed and Fraud

The commission has reason to know, the report declares, that profiteering exists. Much of it is due to advantages taken of the necessities of the times as evidenced in the war pressure for heavy production. Some of it is attributable to "inordinate greed and barefaced fraud." In summarizing the information at hand, certain features appear which it is well to note.

In the case of basic metals, as in steel, when the Government announced a fixed price, it was made so high that it would insure and stimulate production. This has resulted in giving a wide range of profits. Under the device of cost plus a margin of profit, these profits are necessarily great in the case of the low-cost mills. Thus while the market was prevented from running away, as it would have done undoubtedly if it had not been regulated by a fixed price, the stronger factors in the industry are in the opinion of the commission further strengthened in their position and enriched by profits which are without precedent.

The situation in coal gives still another angle of view to the same problem. Maximum prices were fixed by territorial divisions. Many of the coal producers have not taken the maximum, but due to the fact that in a given field there is a very wide range in the cost of the coal produced in that field, it follows that certain low-cost producers have made very large margins under the system of governmental fixed prices for the field. Many high-cost producers have made small margins. The bulk of the production, of course, enjoys the large margin. Information on the return on the investment, now being collated, will reveal the exact amount of profit. Percentages of profit worked upon investment will obviously be very large in the case of low-cost companies.

Results of High Prices

The commission says that the experience with steel and coal shows that a high fixed price, while checking an ascending market, produces an economic situation which is fraught with hardship to the consuming public and with ultimate peril to the high-cost companies through increasing the power of their low-cost competitors.

In this connection, a survey of the petroleum field shows that the market, when under the control of dominating factors, such as Standard Oil, can be one of huge profits without the device of the high fixed price. No price for the public has been fixed upon petroleum and its products by the Government. Unlike the situation in steel and coal, there has been as yet no Government interference with the law of supply and demand except in the instances of Government purchases. Under that law large profits may eventuate through the bidding up of prices by anxious buyers. And, moreover, even in the absence of this element, prices may be forced up by spreading false and misleading information concerning the condition of supply and demand.

Account Juggling

In cases where the Government fixes a definite margin of profit above costs, there is a considerable incentive to a fictitious enhancement of costs through account juggling. This has added to the volume of unusual profits. Increase of cost showing on the producers' books can be accomplished in various ways. The item of depreciation can be padded. Officers' salaries can be increased. Interest on investment can be included in cost. New construction can be recorded as repairs. Fictitious valuations on raw material can be added. And inventories can be manipulated.

The Federal Trade Commission has been vigilant and untiring in its exclusion of these practices, the report declares. Payment of extraordinary salaries and in some instances bonuses to executives of corporations have been found by the commission during its investigations. An illuminating example of high remuneration, charged to the expense account, is that given by the American Metal Co., Ltd., of New York, the chief dealings of which are in zinc. Appended are the salaries and tantieme (French—an interest, commission or proportional amount) of the chief officials:

Name of Payee	Position	Total Payment
B. Hochschild	Chairman of board of directors	$179,663.36
C. M. Loeb	President	364,326.73
Otto Sussman	Vice president; Chief mining department	221,596.04
J. Loeb	Vice-president; Chief sales department	147,930.69
T. Sternfeld	Director and treasurer to June, 1917)	86,342.90
Henry Bruere	Vice-president	82,810.23
Julian B. Beaty	Director and treasurer since June, 1917	77,710.23
H. K. Hochschild	Vice-president, chief South American department	51,810.23
H. V. Putzel	Director and chief of zinc ore department	52,710.23
M. Roos	Cashier and custodian of securities	79,065.35
S. Adler	Chief auditor and accountant	79,065.35
H. Bernstorff	Chief ore department	52,410.23
Sol Roos	Manager St. Louis office	148,530.69
M. Schott	Manager Denver office	136,553.12
William Simon	Assistant manager St. Louis office	38,155.11
W. E. Brady	Manager of transportation department, now Am. Metal Transp. Co.	11,800.00
W. H. Brady	Assistant cashier	9,300.00
H. M. Burkey	Metallurgical department	5,200 00
M. Fauquembergue	Chief clerk sales department	9,300.00
John Fornfinne	Assistant traffic manager	7,400.00
Gustav Loers	Traffic manager	9,150.00
B. F. Phillipson	Assistant manager ore department	9,600.00
E. T. Villareal	Manager foreign metals department	12,200.00
Hans Schild	Bookkeeper	6,190.00
William Weidowke	Clerk, zinc ore department	5,580.00
John MacLetchie	Auditor for subsidiary corporations	12,800.00
B. N. Zimmer	Manager Pittsburgh office and Langeloth Works	10,800.00
H. L. Brown	Mining engineer, Denver office	6,350.00
F. D. Weeks	Chief manager engineer (resigned)	23,500.00
C. E. Kayser	Manager gas operations	7,000.00

In submitting the subjoined memoranda on the industries under consideration, the commission expresses the opinion that general trade, as the commission has opportunity to view it, is in a high state of prosperity. With some exceptions that condition has continued for several years past. Many of the industries are making unusual profits, some are showing outrageous ones. The report says that in an hour of national service and self-sacrifice, profiteering may be defined not only as the taking of an exorbitant profit, but should include a refusal to share in bearing the burdens of war in the form of a reduction in profits when the profits have been large in pre-war times. The report in full as to steel, copper, zinc and nickel follows:

Steel

In 1917, the steel companies made abnormal profits in the period prior to the Government price-fixing policy, and a number have continued to make unusually heavy profits since that policy was inaugurated. In finding costs in this industry for the War Industries Board, the commission divided the steel makers into four groups: (1) the fully integrated mills; (2) the mills which start with the manufacture of pig iron; (3) the mills that start with steel furnaces, and (4) the mills that make rolled products from purchased semi-finished steel. The United States Steel Corporation is included in class one. Its profits expressed in terms of the total amount invested in the business shows net earnings as follows:

1912	4.7 per cent	1915	5.2 per cent
1913	5.7 per cent	1916	15.6 per cent
1914	2.8 per cent	1917	24.9 per cent

The figures, as to the net income of the Steel Corporation as shown by the company for the years 1912, '13, '14, '15, '16 and '17 before deducting Federal income and excess profits tax in 1917 follow:

1912	$77,075,217.00	1915	$97,967,962.00
1913	105,320,691.00	1916	294,026,564.00
1914	46,520,407.00	1917	478,204,343.00

The Federal income and excess profit taxes of the Steel Corporation for 1917 were $233,465,435, which leaves from net income $244,738,908, of which about one-tenth was applicable to interest on bonds of the corporation and the rest available for dividends and surplus.

From information in possession of the commission, mills in class two appear to have made heavy profits in 1917. Recently, mills in class three made objection that the Government prices were too low for them. A special examination of their profits by the Federal Trade Commission showed that in almost every case these objecting mills were enjoying unusual returns. The following table of percentage of return on investment in ten mills in class three will show the profits in 1917:

	1917 Per Cent
Alan Wood, Iron & Steel Co.	52.63
Allegheney Steel Co.	78.92
American Tube & Stamping Co.	40.03
Central Iron & Steel Co.	71.35
Eastern Steel Co.	30.24
Forged Steel Wheel Co.	105.40
Follansbee Bros. Co.	112.48
Nagle Steel Co.	319.67
West Penn Steel Co.	159.01
West Leechburg Steel Co.	109.05

Mills in class four, which buy the semi-finished steel and convert it into the more highly developed steel products, have enjoyed substantial profits.

Copper

Very large earnings have been made in the copper industry, on the whole, although it should be noted that they have been due in part to an unusually heavy demand for this metal, which is used almost exclusively for war purposes directly and indirectly. The commission's figures show that 21 companies, including a large proportion of high-cost companies, made profits in 1917 which ranged from 1 per cent to 107 per cent on their investments. The average profit was 24.4 per cent. Probably over 70 per cent of the production is marketed at profits over 20 per cent on investment. These same companies show an average profit of only 11.7 per cent in 1913, which may be considered to be a normal year. Thus the average profit in the industry has more than doubled. The range of profits in 1913 was from 1 to 56 per cent.

The profits used in these computations do not include Federal income or excess profits taxes, and, therefore, represent sums actually retained by the companies for addition to surplus or dividends.

There does not appear on the whole to have been any concerted action in this industry in putting prices up in the first instance. The war scramble among the Allies shot the prices of copper and other metals to almost unheard of levels. But there are certain strong interests among the producers and marketers which predominate in certain stages of production, and these appear to have taken steps to maintain prices at unnecessarily high levels. In the first place, the smelters, and notably the American Smelting & Refining Co., have continued to hold in force certain deductions for risk of carrying copper bought from mines, which risks have ceased to exist. These deductions were put in force during the early period of the war, before price was fixed by agreement with the War Industries Board. Their present maintenance amounts to profiteering at the expense of the miners, especially the small producers. On the other hand, some of the larger and richer mines have contracts entered before the war running for periods as long as 20 years, which are extremely advantageous to them and which are now causing some refineries to operate at a loss.

Zinc

Most of the evidence in the commission's possession indicates no unusual profits in the zinc industry, with the exception of the operations of the New Jersey Zinc Co. Basing percentage on the capital stock issue of $35,000,000 the following net earnings and dividends are shown for the New Jersey Zinc Co. according to published statistics: 1916, profits, 72.5 per cent, dividends, 76 per cent; 1917, profits, 56 per cent, dividends, 46 per cent. The Federal Trade Commission's figures as to these same net earnings and dividends are available only for 1916, and indicate profits of 95.9 per cent, with dividends of 76 per cent.

These large earnings do not indicate excessive profits on metallic zinc. The company's profits on common spelter are very low, and on grade A spelter, while high, are due to the fact that it possesses a natural monopoly of a certain high grade ore, the product of which cannot sell for less than zinc produced by competitors. In fact, the whole explanation of the New Jersey Zinc Co.'s large profits lies in its possession of an ore body of unusual richness and purity.

Nickel

The dominating factor in the nickel industry is the International Nickel Co., which produces practically the entire output of that metal in this country. The profits of the International Nickel Co. in 1916 were $13,557,000, and the dividends were $10,575,000, which

sums amounted to 40 per cent and 31 per cent respectively based upon the investment as computed by the commission. Taking the total capitalization and surplus of the company as a basis, the net earnings would be 20 per cent and the dividends 15.6 per cent. In 1917 the profits on the commission's basis were 30 per cent and the dividends 24 per cent, and on the basis claimed by the company the profits were 15 per cent and the dividends 12 per cent.

This company has a natural monopoly based on the ownership of the Canadian mines from which the nickel ore is derived. It has, however, maintained prices on a pre-war basis. Consequently, while prices are high and the profits very large, the increase in profits has been due to the increased war output rather than to advances in price. Therefore it does not seem that any profiteering can be charged, unless in a negative sense, i. e., the company might have been satisfied with smaller profits in war times. This is especially worthy of consideration, inasmuch as practically the entire output of the company is taken for war uses.

Director Bruere Explains

Henry Bruere, a Director of the American Metal Co., Ltd., states that the implication of the Federal Trade Commission's statement that this company had sought to conceal its large profits by the device of large bonuses, or "tantieme," to the officers of the company was unfair, as no new departure had been made in this respect from the policy of the company since its organization thirty years ago.

"All the men mentioned are very large stockholders in the company, whose stock has always been very closely held," he said, "and to a large extent their returns represent profits on capital investment. But, beyond this, it has always been the policy of the company, and part of the agreement into which it entered with its executive officers, in lieu of salaries, to pay them a proportional share of the profits earned under their management each year. When the company has a good year they profit very largely, and when it has a poor one they do not do so well. But this plan of proportional division of profits is a very old one, and certainly was not adopted, as the commission implies, merely in order to hide excessive war profits."

Liberty Motor Endorsed

"Tests which recently have been applied in France and this country to the latest American engine have justified the prediction that it would prove a most valuable contribution to Allied resources, and the United States can go ahead and push its production with every confidence," said Sir William Weir, new Secretary to the Air Ministry, who presided at the Wilbur Wright lecture delivered by Dr. Durand, scientific attaché of the American Embassy, in the Central Hall at Westminster, London, June 25. He added: "The results of the experiments so far obtained have placed the engine in the very first line of aeromotors. It is well understood that some criticism will be directed against the slowness of production of these motors during the last three or four months, but I would like to point out that a considerable interval will, and always must, elapse between the experimental and commercial production of any new motor. Every engine, even the best designed and in a country with the greatest resources and facilities, cannot escape a period of what may be called 'teething troubles' before the motors can be produced on anything like a large scale. The Liberty engine is, accordingly, an example of what the Allies might expect in the matter of aircraft production from the scientists and designers of America whom Dr. Durand represents.

"The various methods of utilizing aircraft in warfare are growing rapidly, so rapidly that it is perfectly clear that, even with all the help America can give, the fullest demands which could be made to fulfill all the different functions of aircraft will never be met during the war. We will always require more aircraft, with personnel, than can be possibly supplied to-day."

Organizing Pittsburgh's War Resources

A thorough organization of the War Resources of the Pittsburgh district is expected to come as the result of a meeting of about 400 manufacturers representing four counties in four different states, and held in the Chamber of Commerce Building, Pittsburgh, Wednesday, June 26. George S. Oliver, president of the Pittsburgh Chamber of Commerce, was made commissioner of the Pittsburgh district by the manufacturers at the meeting, and Robert Garland, of the Garland interests, and also a former president of the Chamber of Commerce, was made business manager. The headquarters of the new organization, to be known as the War Resource Committee of Pittsburgh, Region No. 5, have been opened in the Chamber of Commerce Building, with Mr. Garland in charge. The duties of Mr. Oliver as commissioner will be to represent the Government in dealing with manufacturers seeking or willing to accept Government orders for war materials. The business manager, Mr. Garland, will represent the manufacturers. The Advisory Board appointed by Mr. Oliver is as follows:

George L. Brown, Marshall Foundry Co., castings; W. G. Costin, Pittsburgh Screw & Bolt Co., screws and bolts; A. V. Davis, Aluminum Co. of America, aluminum products; James L. Foster, General Chemical Co., chemical products; Roland Gerry, Jones & Laughlin Steel Co., steel producers; A. M. Harper, Carnegie Steel Co., steel; Pennock Hart, Mackintosh-Hemphill Co., foundry products; John W. Hubbard, Hubbard & Co., shovels, etc.; F. J. Kress, F. J. Kress Box Co., boxes; Frank J. Lanahan, Fort Pitt Malleable Iron Co., malleable iron; A. C. Lehman, Blaw-Knox Co., steel products; F. H. Lloyd, Pittsburgh Dry Goods Co., textiles; W. H. Schoen, Edgewater Steel Co., steel; Hamilton Stewart, Harbison-Walker Co., firebrick.

The board's duties will be to attend to the details in bringing manufacturers and purchasers together. This is the plan of organization recommended by Charles A. Otis, Cleveland, who is at the head of the work under the direction of the War Industries Board. For the purpose of bringing about the employment of plants of all kinds upon war work the country has been divided into 20 regions. The Pittsburgh region is subdivided into 13 sub-regions. Each of these will have an organization modeled upon that formed last week, and formed under the auspices of a board of trade or similar body. It is desired that manufacturers of the various regions communicate with Mr. Garland at the earliest possible moment and hasten the formation of their sub-regional bodies. Mr. Oliver was requested, as president of the Chamber of Commerce, to organize the Pittsburgh region to facilitate the Government's task of handling war industries. It is intended to increase production, to fill contracts quickly, to prevent the dislocation of labor, to avoid the complication of the housing problem, to afford concerns having facilities for Government work easy and direct means of securing it and generally to do all those things which will enable industry to give the greatest and speediest aid in the winning of the war.

Shipbuilding on the Pacific

SEATTLE, June 25.—Steel shipbuilders in the Northwest are watching with interest the new railroad freight rates effective June 25 on steel shipments. The advance will materially increase the cost of steel for shipbuilding on the Pacific Coast. Shipbuilding expansion continues at a remarkable pace, and one of the largest and most modern steel shipbuilding plants in the Northwest has recently laid its first keel on Government contracts. In Portland alone it is estimated that when its yards are running full swing, which will be within the next few months, they will be capable of producing 1,000,000 tons of new shipping each year.

Foundries and machine shops are swamped with orders and working 24-hr. shifts to turn work out on schedule. Deliveries have been fair, considering the delays experienced in receipt of raw materials.

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The Report on Profiteering

The report of the Federal Trade Commission to the United States Senate, in response to a resolution calling for facts and figures in regard to profiteering in order to enable Congress to pass appropriate legislation, reminds one of many stump speeches of the days when muck-raking was more popular than it is to-day. We say this with no thought of defending profiteering in any way or even of questioning the sweeping allegations of the commission in regard to the packing industry and some others whose methods are rebuked with scathing words. It may be, and probably is true, as the commission says, that some of the profiteering is attributable to "inordinate greed and barefaced fraud," but the unfortunate fact is that the commission leaves the impression that business in general is being conducted in a rascally manner. The report contains not one word of commendation for the efforts that have been made by countless companies and business men to conform to the law and to the wishes of officials of the National Government. Nothing is said of the patriotic service rendered in many ways by the business men of the country, but the newspaper reader is given to understand that unfair and extortionate profits are being made by many industries and that war business methods in general are reprehensible.

As to the iron and steel business, the commission indulges in no extreme language of condemnation, but points out that certain steel companies have made large profits. It is well known that large profits were made in 1917 in the steel industry. But they were due largely to business negotiated before the United States entered the war. On a much lower basis of prices the steel manufacturers agreed to furnish the Government all the steel it required and at the same time agreed to give the benefit of the same prices to the Allied Governments and to the American public. The accusation of profiteering implies either an illegal charge or a charge made possible by a monopoly of supply. The former method is alleged in the case of some of the flour mills; the latter is alleged of the packing interests. Nothing of either sort has existed in the steel trade, apart from the exceptional cases in which, on a total tonnage quite insignificant, more than the agreed price was asked. The iron and steel manufacturers have furnished their products at prices really fixed by the Government's representatives after a protracted investigation of costs by the Federal Trade Commission. The advantages of the more highly integrated companies have brought them earnings to figures representing a high return on capital. From these companies the Government has contrived to secure revenues in the form of direct taxes on a scale equally unprecedented, making the contribution of the iron and steel industry to the carrying on of the war not far from 10 per cent of the $4,000,000,000 which it was aimed to raise by Federal taxation in the past year. The spirit of the manufacturers is such that they would be willing to pay much more if it were equitably determined that their share was more.

It is to be said, further, that the average individual consumer has been but little affected, scarcely touched in fact, by the large earnings of the steel companies. Steel is a commodity of which the great bulk is ordinarily bought by railroads, shipyards, building companies and corporations manufacturing products into which steel enters. When advances in prices come, the ultimate consumer is only fractionally and indirectly affected. In the past three years of war profits in steel the main contributors have been the Allied Governments, the railroads, shipyards, the neutral buyers of our exported steel and the Government of the United States. The effort to connect steel profits with flour, meat and other profits which have enhanced the cost of living is a misleading and unworthy piece of politics, the intended bearing of which on the present hearings to determine the new war taxes is obvious even to the reader who runs.

Standardize Wage Scales

It is greatly to be hoped that the stabilizing and standardizing of wage scales in the war industries, a plan for which is being formulated, will speedily become an accomplished fact. The War Labor Board could then base its decisions in wage disputes on a clearly defined policy which would preserve the balance of labor compensation, maintain time-honored and justifiable differentials

and give manufacturers some definite basis of reckoning labor costs. Raw and finished material and transportation costs are definitely adjusted, and employers are entirely justified in asking for relief from the unending demands that have made all estimates of future labor costs mere guesswork.

A harassing phase of the situation lies in the efforts being made to abrogate the old wage differentials representing the varying costs of living as between large cities and small manufacturing centers. Cheaper rents, garden plots yielding fresh vegetables at the cost of cultivation, the proximity of homes and factories with its saving in carfare, similar saving from the use of bicycles, also the absence of many urban lures which absorb money—these advantages have heretofore justified a lower wage in smaller places, the difference usually ranging from 25 to 50 cents a day. Of late vigorous campaigns have been conducted by union organizers, not only to bring the wages in the small towns up to the level of those in the big centers, but the small-town wage in some instances, as a result of pressure exerted by the unions, has been pushed up beyond rates in the large cities. To effect such results the strengthening of union organization is going on apace. Recognizing the justice of a differential, the men in the cities in turn demand advances on the ground of higher wages prevailing in towns of more moderate living cost.

An aggravated case of wage discrepancy is found in Detroit, where there are no less than three wage scales for the same or similar work. The union molders in November proclaimed a scale of $5.50 for nine hours, an advance of $1 over the previous year. In April, this year, the wage adjusters for the Shipping Board fixed a rate for the molders in the Lake yards equivalent to that prevailing on the seaboard—72½ cents an hour, or $5.80 a day for eight hours, with time and a half for overtime. A few days ago union molders in a dozen shops in Detroit went on strike, their demand being for $6 for 8 hours. Realizing that they could not receive official sanction of a strike, they conducted what was called an independent strike. Shops employing about 150 molders conceded the $6 for eight hours, with the result that three basic wage scales are in force. Incidentally, all the shops are operating nine hours.

Charles Piez, vice-president and general manager of the Emergency Fleet Corporation, has said, and similar expressions have come from others, that for individual manufacturers to meet the wage schedule prevailing in the corporation's yards would be unpatriotic, yet the activities of local unions are forcing that very condition on employers.

Meanwhile, manufacturers flounder in vain efforts to learn what is expected of them. An instance of the conditions referred to in the matter of differentials exists in Warren and Cleveland, Ohio. In the former city a basic rate of $6 for nine hours has been established, while in Cleveland, with its higher cost of living, the rate is $5.50 for nine hours. At Chicago, following the recent strike of molders, the War Labor Board fixed a rate of $5.50 for eight hours. Yet at Manitowoc, Wis., only a short distance away, labor leaders are working to secure $5.80 for eight hours for molders.

Standardizing wage scales is admittedly no small task. One solution might lie in a scale based on the conditions of previous years, with suitable allowances for increased costs resulting from the war. There is a suggestion in the method used by the Railroad Wage Commissioner which, among other determinations, found the purchasing value of a dollar in 1915 and in 1918. If something is not done it is not unlikely that the better class of workers, under the circumstances described, will gravitate to small places where they can enjoy the advantages of cheaper living and wages equal to or better than those prevailing in the crowded centers. In self-defense, the cities must then advance their wage rate, and another cycle is started.

The Bridgeport Wage Controversy

Fair, open and above board is the attitude taken by the manufacturers of Bridgeport, Conn., at the preliminary hearing before the National War Labor Board on July 1. The industrial peace and welfare of the city of Bridgeport seems assured when its manufacturers take the stand outlined below, and the fact that their position was indorsed by the Taft-Walsh board gives promise that the end of Bridgeport's labor troubles is at hand. The complete consideration of the wage rates for the machine industries of an entire city will probably result in the enunciation of principles that will have a far-reaching effect upon all the industries employing machinists. Briefly, the position taken by the Bridgeport employers and sustained by the Board is this:

The present controversy for the settlement of which the Taft-Walsh board is now sitting in Bridgeport affects only toolmakers and machinists as a class, within the narrowest definitions of such workers as a class, and affects only that portion of the machinists and toolmakers represented through organized labor.

If it is right and just for the employees thus represented—not more than 10 per cent of the productive employees—to receive a wage adjustment based on the principles laid down by the National War Labor Board, then it is equally just and essential that the unrepresented 90 per cent of the factory employees receive a wage adjustment arrived at in a similar way.

Such a settlement, we understand, is asked by every important manufacturer in Bridgeport. Nothing could be more indicative of the keen desire of these Bridgeport employers to deal fairly with their men than the fact that this proposition was brought forward by the manufacturers themselves and submitted to the Taft-Walsh board to broaden the scope of the inquiry now in progress.

Both sides of this controversy made clear in their preliminary statements that they are actuated by the same thought—that come what may America must win the war. The greatest contribution a leading munitions center like Bridgeport

can make to the winning of the war is through the maximum delivery of the products of the munitions and machine tool factories that have made that city famous—products essential to the success of the Allies and on which to an unusual degree the very lives of the men in General Pershing's army depend.

It is obvious that repeated labor disputes impair this flow of munitions. It is equally obvious that a wage settlement by the Taft-Walsh board, or by any other body, that affected only 10 per cent of the wage earners and left the other 90 per cent untouched would not bring about a cessation of labor unrest; it would be an invitation to more unrest. The War Department had recognized this fact by equipping the Taft-Walsh board with power to consider questions beyond the scope of the original inquiry, and the occasion now has arisen through the voluntary action of the Bridgeport manufacturers in asking that all of their productive employees be taken into consideration adjusting the wage scale on the basis of local cost of living.

The New Ore Prices

The new prices on Lake Superior iron ores resulting from the advance of 45 cents per ton, authorized by the War Industries Board with the approval of President Wilson, represent the highest market in 35 years. Since the late eighteen-eighties the prices of these ores, so far as a very large percentage of the tonnage was concerned, have been fixed, with one notable exception, by the initial sales, which usually have been followed by contracts involving very large amounts. The one exception which stands out in the history of the trade, was furnished by the experience of 1908. Following the panic of 1907, and contrary to the judgment of a number of prominent men in the ore business, the 1907 ore prices were reaffirmed in February, 1908. The furnaces refused to buy and on June 15 prices were reduced 50 cents. The buying which then started was the latest on record. Often in earlier years, the buying for one year had taken place in the winter of the preceding year or in the first three months of the year in which the ore was to be delivered.

When the President, on March 26 last, announced that the agreed prices on iron and steel products would be continued for three months beyond March 31, except that basic pig iron and heavy melting scrap would be reduced $1 April 1, the action was regarded as a reaffirmation of the 1917 ore prices, and by agreement of the ore companies ore unloaded prior to July 1 will be invoiced at the old price, but the new prices based on $6.40 at lower Lake docks for old range Bessemer will govern on all ore unloaded on July 1 or later. This means that the new prices will prevail on about 45,000,000 tons, including ore owned by steel companies, if the entire Lake movement amounts to 65,000,000 tons.

When, in November, 1916, it was announced that the ore-carrying charge from the head of the Lakes to lower Lake docks would be $1, or 50 cents more than the 1916 rate, it was clear that an advance in the price of ore would be made. Initial sales were soon announced at an advance of $1.50, making the old range Bessemer ore base price $5.95. No difficulty was experienced in disposing of all ores on this basis. The 1917 prices on Mesaba Bessemer were the highest since the opening of that range and on old range they were higher than at any time since 1887, when the price was $6. Old range non-Bessemer was higher in 1917 that at any time since 1890, when the price was 5 cents higher than in 1917. The new prices for 1918, although the highest in many years, show an advance of only 7.6 per cent over 1917, which is moderate compared with the advances made in other prosperous years; as, for example, 13 per cent in 1906; 17 per cent in 1907; 11 per cent in 1910; 17 per cent in 1913; 18 per cent in 1916 and 33 per cent in 1917. In view of the increased freight rates and other additional railroad charges, the advance cannot be considered unreasonable. It has, however, brought forward the claims of some furnace operators on whom the ore advance imposes special hardship. It is a question whether the Government can consider the suggestion that it guarantee the high-cost furnaces a supply of ore at prices at which they can operate. Its answer may be that the output of such furnaces can be compensated by the better operation of others which, if some of the smaller furnaces dropped out, would get the latter's coke supply.

Moving Photomicrographs

The moving picture has entered a new field. When it first appeared few could have imagined that it would ever be applied microscopically in metallurgy. What was probably the first instance of this kind was one of the surprises of the annual meeting of the testing engineers at Atlantic City last week, referred to on another page. The various changes in structure and the results of stresses taking place in wrought iron when subjected to repeated bendings were shown with admirable skill and effect.

Professor Moore of the University of Illinois, who took the picture, has probably introduced a method of investigation of far-reaching importance, both technically and practically. It is believed that the new idea will be successfully applied to steel, non-ferrous metals and various alloys in the near future. Besides explaining many interesting phenomena, not now fully understood, it may settle some controversies which otherwise would remain open much longer. It may determine just how steel begins to deteriorate under stress, whether through the crystal or in some other way. A solution of this problem might lead to a heat treatment prolonging the life of certain steels and making them less liable to fatigue. The moving photomicrograph may show also whether in plastic deformation of steel the change is due to slip bands or, according to the other contention, to a change in orientation. Applied to brass and special alloys, where crystal formations are large and definite, it may give important results.

Professor Moore has rendered a distinct service and may have opened up a broader field than is now realized.

WAR DEPARTMENT SAVINGS

Two Months Economies Have Totaled $3,750,000—Rifles Now $22

WASHINGTON, July 2.—A saving of more than $8,-000,000 by means of salvage, waste prevention and the utilization or sale of discarded materials has been made in the last two calendar months by the small arms section, procurement division of the Ordnance Department, according to an official statement made by the War Department. A detailed report to the Acting Chief of Ordnance, Gen. C. C. Williams, shows the following economies:

Arms branch	$1,395,398.52
Machine gun branch	6,165,218.22
Ammunition branch	1,196,408.85
Total saving for two months	$8,757,025.59

Slight changes in manufacturing processes enabled the arms branch to save some $43,000 on rifles. Approximately $528,000 was saved by obtaining bidders not heretofore participating in competition for contracts on appendages and accessories. Cooperation with the War Industries Board in purchases brought a saving of almost $40,000. Revision of the requirements for spare parts on pistols and rifles enabled the branch to save $522,862, and savings on arms, repair chests and accessories totaled $262,570.94. Examples of economies effected include the elimination of the waxing and buffing of gunstocks and the substitution of an oil finish, which saves $17.50 per thousand on the rifles. Field cleaning rods were reduced from 49 to 35 cents each. The price of smokeless barrel steel has been reduced from 12 cts. to 10cts. per pound.

The machine-gun branch has kept in close touch with manufacturers in order to be in position to insist upon reduction in prices whenever tooling-up charges, etc., have been written off. By this means it has been able to reduce the price of Vickers machine guns $322.35 each, Colt machine guns $284.16 each, and Lewis machine guns $22 each. The machine-gun branch report that it applies the same principle to the various machine-gun accessories.

The ammunition branch made most of its savings on the clips and bandoleers, although it was able to save on small-arms ammunition, such as 0.30-caliber shells and 0.45-caliber automatic pistol ball cartridges, etc.

The tool cost of rifles is checked very carefully in every factory. All material purchased for the manufacture must be approved before the contract is placed, and the price paid can not exceed that accepted by the War Industries Board and agreed to by the steel manufacturers and approved by the President. Labor cost is carefully checked and manufacturing methods inspected closely.

The result has been that the Government has reduced the price of rifles as compared with the price asked by manufacturers at the outset of the war by approximately $13 each. When the placing of rifle contracts was first considered at the beginning of the war, rifle companies considered $35 to $40 a fair price. At present the Government's rifles cost about $22 each to manufacture.

The Ordnance Department's Specifications for Semi-Steel Shells

On page 1680 of THE IRON AGE of June 27 were published the specifications for semi-steel shells which have been under preparation for some months by the engineering division of the Ordnance Department. The statement is now added that this publication was not authorized by the Ordnance Department. In the same connection we repeat the statement which accompanied the publication made last week, that "the specifications as they stand are still subject to modification as the result of experiments now being conducted."

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PUDDLERS' WAGES

Highest Scale on Record—Sheet and Tin Plate Rates Adjusted

At the wage conference held at Atlantic City, N. J., last week between committees of the Amalgamated Association of Iron, Steel and Tin Workers and the Western Bar Iron Association it was found that the average price on shipments of bar iron in May and June was 3.35c. per lb. as against 3.33c. in March and April. This entitles puddlers to an advance of 25 cents per ton for boiling or from $16.05 to $16.30.

For July and August this is very much the highest wage rate ever paid for boiling in the history of the bar iron trade. Puddling plants in the Central West, including those of the Youngstown Sheet & Tube Co. at East Youngstown, Ohio, and the Girard Iron Co. at Girard, Ohio, do not sign the Amalgamated wage scales, being operated non-union, but will pay the new Amalgamated rate of $16.30 per ton for July and August.

At Atlantic City last week a wage scale for tin house labor was also adopted for the year starting July 1. In tin plate mills that sign the Amalgamated scale tin house labor was formerly on a flat rate basis but at the conference last week a sliding scale basis for this labor was adopted, which will give tin house men a considerable advance in wages but definite figures have not been worked out.

All the Amalgamated wage scales for the year beginning July 1 have been arranged, these including the sheet and tin plate scales, the tin house scale and the bar iron scale. In deciding upon the scales in sheet and tin plate mills, the main change was an advance of 5 per cent for heating in tin plate mills.

IRON OUTPUT STEADY

June Pig-Iron Product 3,323,791 Tons

Daily Production Only 400 Tons Below May Rate—Net Loss of Four Stacks

Pig-iron production in June was 3,323,791 gross tons as compared with 3,446,412 tons in May, and the daily rate in June was 110,793 tons or 382 tons less daily than in the foregoing month. Steel works daily output, however, was 81,734 tons in June, slightly greater than the 81,238 tons per day in May. Coke and anthracite pig iron produced in the first half of this year, 18,002,672 gross tons, falls short of that for the same periods of 1917 and 1916 by over 1,000,000 tons. A total of 355 furnaces were in blast July 1, 15 having been blown out and 11 blown in.

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces in June and the three months preceding:

Monthly Pig-Iron Production—Gross Tons

	March (31 days)	April (30 days)	May (31 days)	June (30 days)
New York	186,908	214,179	237,044	222,908
New Jersey	16,102	22,518	24,339	26,990
Lehigh Valley	117,161	111,312	115,069	99,231
Schuylkill Valley	74,256	89,959	91,751	95,572
Lower Susquehanna and Lebanon Valleys	69,691	66,730	76,316	75,023
Pittsburgh district	656,273	665,665	695,794	686,658
Shenango Valley	157,875	168,056	177,911	166,036
Western Pennsylvania	198,843	203,341	199,604	190,596
Maryland, Virginia and Kentucky	98,163	93,561	96,472	90,769
Wheeling district	112,106	123,211	134,234	133,220
Mahoning Valley	301,863	306,317	330,627	296,585
Central and Northern Ohio	265,719	266,476	286,568	287,264
Southern Ohio	66,794	65,522	67,853	68,062
Chicago district	506,036	530,310	543,409	536,788
Mich., Minn., Mo., Wis. Col. and Wash.	122,323	119,663	125,437	114,566
Alabama	228,988	208,820	210,671	203,292
Tennessee and Ga	33,998	33,468	33,413	30,231
Total	3,213,091	3,288,211	3,446,412	3,323,791

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from June, 1917, is as follows:

Daily Rate of Pig-Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
June, 1917	76,805	32,197	109,002
July	76,440	31,380	107,820
August	71,436	33,336	104,772
September	73,290	31,175	104,465
October	76,664	29,886	106,550
November	77,135	29,724	106,859
December	66,605	26,392	92,997
January, 1918	55,662	22,137	77,799
February	56,938	25,897	82,835
March	74,526	29,122	103,648
April	79,199	30,408	109,607
May	81,238	29,937	111,175
June	81,734	29,059	110,793

Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies show the following totals of steel-making iron month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Total production			Spiegeleisen and ferromanganese		
	1916	1917	1918	1916	1917	1918
Jan.	2,251,035	2,244,203	1,756,208	24,866	38,792	30,695
Feb	2,183,845	1,829,846	1,620,254	23,877	32,137	26,114
Mar.	2,365,116	2,285,430	2,349,419	29,388	36,563	39,122
Apr.	2,316,768	2,370,937	2,411,488	31,862	39,595	35,511
May	2,408,890	2,404,380	2,513,577	35,844	37,701	54,633
June	2,295,784	2,304,155	2,407,166	38,597	30,829	44,844
July	2,306,303	2,369,630	.....	31,353	43,884	.....
Aug.	2,313,122	2,214,513	.....	33,338	39,492	.....
Sept.	2,309,710	2,198,705	.....	29,451	42,235	.....
Oct.	2,530,806	2,376,589	.....	34,566	48,691	.....
Nov.	2,404,210	2,349,545	.....	44,975	34,688	.....
Dec.	3,294,620	2,094,659	.....	43,470	29,902	.....

Capacity in Blast July 1

The following table shows the number of furnaces in blast July 1 in the different districts, also the number and daily capacity in gross tons of furnaces in blast June 1:

Coke and Anthracite Furnaces in Blast

Location of furnaces	Total number of stacks	July 1 Number in blast	July 1 Capacity per day	June 1 Number in blast	June 1 Capacity per day
New York:					
Buffalo	20	20	6,754	20	6,838
Ferro	1	1	20	1	50
Other N. Y.	4	3	614	3	614
New Jersey	4	4	756	4	756
Ferro	1	0	0	1	30
Pennsylvania:					
Lehigh Valley	21	13	3,168	14	4,024
Spiegel	2	2	200	1	100
Schuylkill Val.	12	12	3,087	10	2,856
Spiegel	1	1	78	1	78
Lower Susquehanna Valley	8	7	1,795	6	1,573
Ferro	2	2	89	2	89
Lebanon Val.	8	4	685	4	600
Ferro and Spiegel	3	3	188	3	200
Pittsburgh Dist.	53	51	25,200	49	21,830
Ferro and Spiegel	4	3	517	4	713
Shenango Val.	19	16	5,535	17	5,740
Western Pa.	25	22	6,230	21	6,300
Spiegel	3	2	173	2	139
Maryland	4	3	1,000	3	1,052
Wheeling District	14	13	4,441	13	4,696
Ohio:					
Mahoning Val.	26	23	9,678	25	10,407
Central and Northern	26	23	9,909	24	9,397
Southern	17	15	2,269	16	2,383
Illinois and Ind.	41	38	17,947	37	17,472
Ferro	1	1	61	1	57
Mich., Wis. and Minn.	12	9	2,528	10	2,736
Col., Mo. & Wash.	7	5	1,035	5	1,193
Ferro	1	0	0	1	117
The South:					
Virginia	15	10	1,372	9	1,286
Ferro and Spiegel	4	3	106	4	102
Kentucky	7	5	654	5	648
Alabama	36	31	6,776	31	7,022
Ferro and Spiegel	1	1	35	1	92
Tenn. and Ga.	16	11	1,020	11	1,100
Total	419	355	113,800	359	112,290

Diagram of Pig-Iron Production and Prices

The fluctuations in pig-iron production from 1910 to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production by months of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnace at Chicago and No. 2X at Philadelphia. They are based on the weekly market quotation of THE IRON AGE.

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Beginning Jan. 1, 1914—Gross Tons

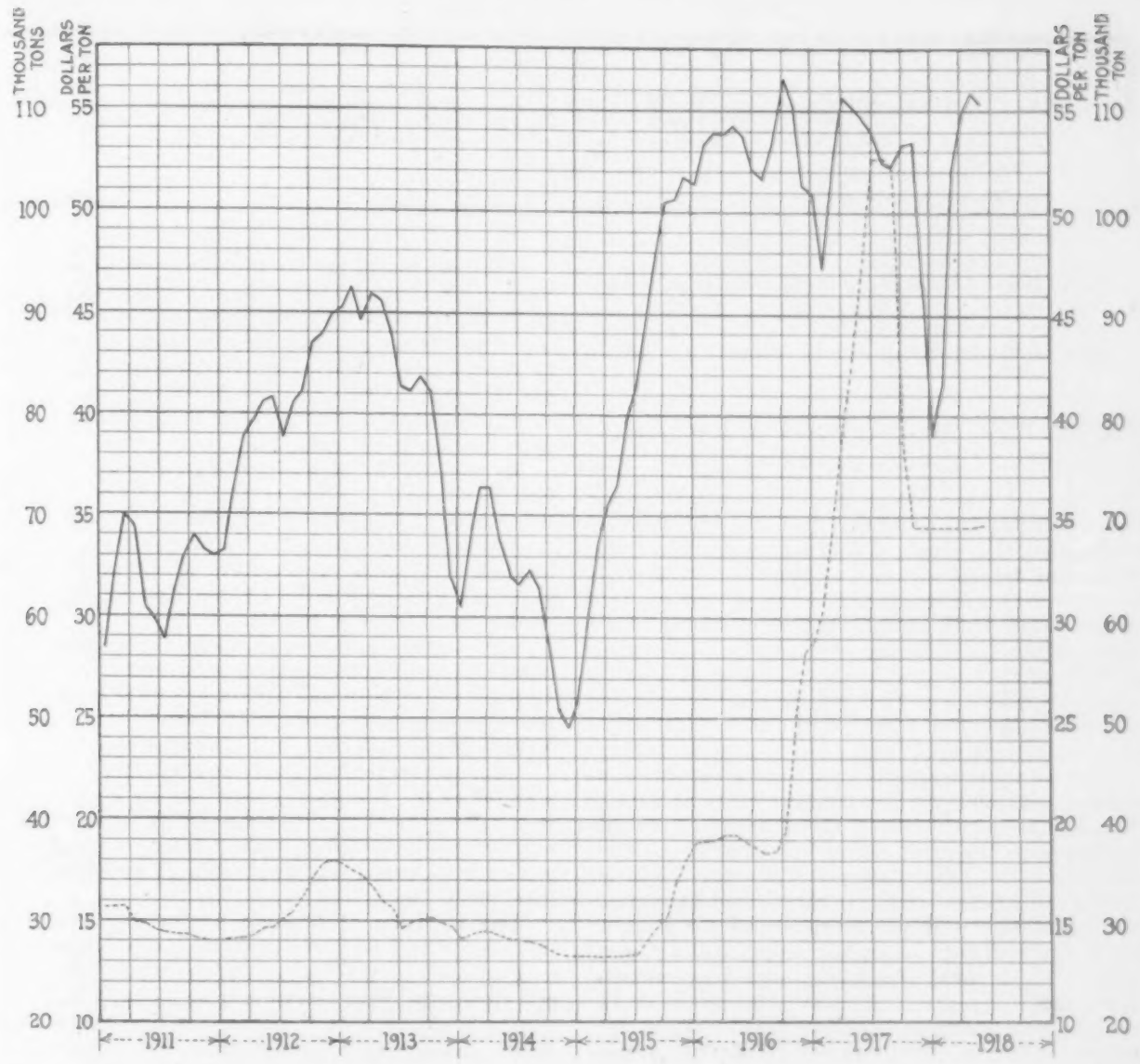
	1914	1915	1916	1917	1918
Jan.	1,885,054	1,601,421	3,185,121	3,150,938	2,411,768
Feb.	1,888,670	1,674,771	3,087,212	2,645,247	2,319,299
Mar.	2,347,867	2,063,834	3,337,691	3,251,352	3,213,091
Apr.	2,269,655	2,116,494	3,227,768	3,334,960	3,288,211
May	2,092,686	2,263,470	3,361,073	3,417,340	3,446,412
June	1,917,783	2,380,827	3,211,588	3,270,055	3,323,791
6 mos.	12,401,715	12,100,817	19,410,453	19,069,892	18,002,672
July	1,957,645	2,563,420	3,224,513	3,342,438	.....
Aug.	1,995,261	2,779,647	3,203,713	3,247,947	.....
Sept.	1,882,577	2,852,561	3,202,366	3,133,954	.....
Oct.	1,778,186	3,125,491	3,508,849	3,303,038	.....
Nov.	1,518,316	3,037,308	3,311,811	3,205,794	.....
Dec.	1,515,752	3,203,322	3,178,651	2,882,918	.....
Total, yr.*	23,049,752	29,662,566	39,039,356	38,185,981	.....

*These totals do not include charcoal pig iron. The 1917 production of this iron was 376,525 tons.

The figures for daily average production, beginning with January, 1911, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1911—Gross Tons

	1911	1912	1913	1914	1915	1916	1917	1918
Jan.	56,752	66,384	90,172	60,808	51,659	102,746	101,643	77,799
Feb.	64,090	72,442	92,369	67,453	59,813	106,456	94,473	82,835
Mar.	70,036	77,591	89,147	75,738	66,575	107,667	104,882	103,648
Apr.	68,836	79,181	91,759	75,665	70,550	107,592	111,165	109,607
May	61,079	81,051	91,039	67,506	73,015	108,422	110,238	111,175
June	59,585	81,358	87,619	63,916	79,361	107,053	109,002	110,793
July	57,841	77,738	82,601	63,150	82,691	104,017	107,820	.....
Aug.	62,150	81,046	82,057	64,363	89,666	103,346	104,772	.....
Sept.	65,903	82,128	83,531	62,753	95,085	106,745	104,465	.....
Oct.	67,811	86,722	82,133	57,361	100,822	113,189	106,550	.....
Nov.	66,648	87,697	74,453	50,611	101,244	110,394	106,859	.....
Dec.	65,912	89,766	63,987	48,896	103,333	102,537	92,997	.....



The Full Line Represents the Daily Production of Pig Iron and the Dotted Line Is the Average of the Cost Per Ton of No. 2 Southern Pig Iron at Cincinnati, Local No. 2 Iron at Chicago and No. 2X Iron at Philadelphia

The list of furnaces blown in comprises one Lock Ridge and one Palmerton in the Lehigh Valley, Brooke in the Schuylkill Valley, one Steelton in the Lower Susquehanna Valley, one Clairton and one Duquesne in the Pittsburgh district, one Farrell in the Shenango Valley, Colonial in western Pennsylvania, one Joliet in the Chicago district, Alabama City and one Ensley in Alabama.

The furnaces blown out include one Wharton in New Jersey, one Bethlehem and one Saucon in the Lehigh Valley, one Aliquippa in the Pittsburgh district, Alice and Fannie in the Shenango Valley, McKeefrey and one Haselton in the Mahoning Valley, one Cleveland in Northern Ohio, Jisco in the Hanging Rock region, one Mayville in Wisconsin, one Colorado stack, Eagle, Alice and one Ensley in Alabama.

Zenith Furnace to Be Improved

Freyn, Brassert & Co., People's Gas Building, Chicago, have been retained by the Zenith Furnace Co., Duluth, Minn., for the remodeling of the Zenith furnace, the installation of a Brassert gas-washing and drying unit, the erection of a new hot-blast stove and other plant improvements.

Eric Joseph and W. W. Steinthal, directing heads of the Orenstein-Arthur Koppel Co., whose plant at Koppel, Pa., near Pittsburgh, was recently seized by the Government, will be interned at Fort Oglethorpe, Ga., during the period of the war. Eight other officials have been paroled under pledge that they will fully comply with all the laws concerning German alien enemies.

Blast Furnace Notes

The Hanging Rock Iron Co., Hanging Rock, Ohio, will make a number of improvements to its Hamilton blast furnace plant. These will include the installation of a skip bridge, revolving distributor, two scale cars, and one 50-ton transfer car. The contract for this equipment has been placed with the A. G. McKee Co., Cleveland.

New Jersey Zinc Co. blew in its No. 2 furnace at Palmerton, Pa., June 21, after relining.

The Sheffield Coal & Iron Co. blew in one of its furnaces at Sheffield, Ala., in June.

At present the Carnegie Steel Co., Pittsburgh, is operating 56 out of its 59 blast furnaces. Only two Edgar Thomson and one Zanesville stack are idle. The two Edgar Thomson stacks at Bessemer are being raised above flood stage, repaired and relined. They will not be ready for operation before fall.

The Struthers Furnace Co., Struthers, Ohio, is planning extensive repairs to its plant. Two new boilers will be installed to replace old boilers now in use and two new generators will be added. A slag-crushing plant will also be installed. Contracts will be placed shortly.

The Canadian Ferro-Alloys, Ltd., Shawinigan Falls, Que., is building a plant there for the production of ferroalloys. The company will be in a position to ship 17 tons of 50 per cent ferrosilicon daily, in addition to other products. F. A. Raven is general manager.

Iron and Steel Markets

PRIORITIES NOT ESSENTIAL

Discretion on Shipments Given to Mills

Further Price Adjustments—Pig Iron Output Slightly Less in June

The steel trade has read with keen interest and some surprise the messages just sent broadcast by the Priorities Committee telling manufacturers that on a considerable amount of their output priority certificates are not needed. The discretion thus given to the mills has relieved some of the strain under which the industry was laboring. However, it does not change by a single ton the amount of the country's output required for the Government and its Allies, and therefore holds out no immediate prospect of release of material for general use.

At the same time the new orders recognize, as has not been done before, the possibility of gaps in mill schedules, which will afford leeway to manufacturers in the distribution of material to their customers, including jobbers. Thus far the latter have got little light from the mills beyond the statement that they will not receive steel for stocking up in the ordinary sense, but only for definite replacements of what has been shipped to essential industries.

The steel manufacturers' committee is in conference at Washington this week (Wednesday), with a view to fixing prices on rails, wire rope and steel and malleable castings. The question of some pig-iron readjustment is also up, but the proposed Valley basing for prices finds much opposition. Southern producers in particular would be unfavorably affected, since on top of other troubles they would have to absorb the freight on a large part of their shipments to the North.

Lake Superior ore producers have decided that the 45c. advance in price shall apply only in part to 1918 contracts—that is, to ore unloaded at Lake Erie docks after midnight of June 30.

June pig iron returns by wire, with several furnaces estimated, indicate a very slight falling off last month, the total being 3,323,791 gross tons for 30 days, or 110,793 tons a day, against 3,446,412 tons in May, or 111,175 tons a day. As the May rate had been exceeded but once, the June performance is considered satisfactory, in view of the number of furnaces being forced out for relining. Fifteen were blown out and 11 were blown in last month, a net loss of four, leaving 355 furnaces active July 1, with an estimated capacity of 113,800 tons a day.

While large Government orders continue to be given out, good headway has been made by the mills, particularly on shell and ship steel. Some of the forging plants as well as shipyards now have on hand all the steel they were entitled to receive up to July 1. But it is to be considered that the mills were not affected in the slightest by hot weather in June, and that reduced output is almost inevitable in July.

Pig iron producers from all sections meeting at Pittsburgh June 28 had chiefly to consider the plight of Tennessee and Virginia furnaces under advancing costs. Arrangements may be made to put some of these stacks on low-phosphorus iron, for which the Government will find the necessary ore supply. A considerable shipment of low-phosphorus ores from Europe is not unlikely.

Of the 180,000 tons of basic iron to go to England in September, October and November, 100,000 tons has been apportioned to Southern furnaces, the remainder going chiefly to Northern Ohio. There is some indication in the East of an increase in basic pig-iron production by the turning of some stacks from foundry grades.

For France 40,000 tons more barb wire has been allocated and 14,000 tons of wire rods. A fresh distribution of wire nail orders has been made, but for only somewhat more than 10 per cent of the 300,000 kegs of the original allocated order.

Railroad structural steel requirements continue a factor in the fabricating field, adding measurably to the demands from ship construction, special Government projects and war plant extensions. Three piers for a Government warehouse at Brooklyn will take 9000 tons.

The abolition of Chicago basing in the three leading finished products narrows the gap that has long existed in the Chicago district between iron and steel bars, with the former at 3.50c., but there will be no change in the long-standing custom of selling bar iron on a Chicago base. In some recent sales a 3.50c. mill price on bar iron has reappeared in the East.

All June records for Lake Superior ore shipments were broken last month, with a total close to 9,900,000 tons, one dock being estimated.

A change in the copper price seems imminent, indications pointing to a 25c. level. Lead producers have made their own adjustment to a basis of 7.90c. New York or 7.75c. St. Louis.

Pittsburgh

PITTSBURGH, July 2—(*By Wire*).

A meeting of 50 or more blast furnace operators from all over the country was held in the William Penn Hotel, this city, on Friday, June 28, at which H. G. Dalton, chairman of the Committee on Pig Iron, Iron Ore and Lake Transportation, presided. Mr. Dalton made a statement to those present explaining why it did not seem wise to make any changes in prices on pig iron during this quarter. Some of the furnace owners from Tennessee and Virginia stated that present prices of pig iron were from $3 to $4 per ton lower than their costs, and in several of these cases plans were made to allow these furnaces to go on low phosphorus iron, the Government to furnish orders for it. There was a pretty full interchange of views, and it is the intention of the Committee on Pig Iron, Iron Ore and Lake Transportation to assimilate the information gathered and make a report to an adjourned meeting in Cleveland the latter part of this week or early next week.

The warm-blast charcoal iron makers met in the morning, and several of them stated that they are

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	July 2 1918	June 25 1918	June 4 1918	July 3 1917
No. 2 X, Philadelphia	$34.40	$34.40	$34.25	$52.00
No. 2, Valley furnace	33.00	33.00	33.00	55.00
No. 2 Southern, Cincinnati	36.90	36.90	35.90	49.90
No. 2, Birmingham, Ala.	33.00	33.00	33.00	47.00
No. 2, furnace, Chicago*	33.00	33.00	33.00	55.00
Basic, deliv., eastern Pa.	32.90	32.90	32.75	50.00
Basic, Valley furnace	32.00	32.00	32.00	52.00
Bessemer, Pittsburgh	36.60	36.60	36.30	57.95
Malleable, Chicago*	33.50	33.50	33.50	55.00
Malleable, Valley	33.50	33.50	33.50	53.00
Gray forge, Pittsburgh	33.40	33.40	32.75	47.95
L. S. charcoal, Chicago	37.85	37.85	37.50	57.00
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	55.00	55.00	55.00	38.00
O.-h. rails, heavy, at mill	57.00	57.00	57.00	40.00
Bess. billets, Pittsburgh	47.50	47.50	47.50	100.00
O.-h. billets, Pittsburgh	47.50	47.50	47.50	100.00
O.-h. sheet bars, P'gh	51.00	51.00	51.00	105.00
Forging billets, base, P'gh.	60.00	60.00	60.00	125.00
O.-h. billets, Philadelphia	51.30	51.30	50.50	110.00
Wire rods, Pittsburgh	57.00	57.00	57.00	95.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	3.73	3.73	3.685	4.659
Iron bars, Pittsburgh	3.50	3.50	3.50	4.75
Iron bars, Chicago	3.50	3.50	3.50	4.50
Steel bars, Pittsburgh	2.90	2.90	2.90	4.50
Steel bars, New York	3.145	3.145	3.095	4.669
Tank plates, Pittsburgh	3.25	3.25	3.25	9.00
Tank plates, New York	3.495	3.495	3.445	9.169
Beams, etc., Pittsburgh	3.00	3.00	3.00	4.50
Beams, etc., New York	3.245	3.245	3.195	4.669
Skelp, grooved steel, P'gh.	2.90	2.90	2.90	4.00
Skelp, sheared steel, P'gh.	3.25	3.25	3.25	6.00
Steel hoops, Pittsburgh	3.50	3.50	3.50	5.25

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	July 5 1918 Cents	June 25 1918 Cents	June 4 1918 Cents	July 3 1917 Cents
Sheets, black, No. 28, P'gh.	5.00	5.00	5.00	8.50
Sheets, galv., No. 28, P'gh.	6.25	6.25	6.25	10.00
Wire nails, Pittsburgh	3.50	3.50	3.50	4.00
Cut nails, Pittsburgh	4.00	4.00	4.00	4.65
Fence wire, base, P'gh.	3.25	3.25	3.25	3.95
Barb wire, galv., P'gh.	4.35	4.35	4.35	4.85
Old Material, Per Gross Ton:				
Carwheels, Chicago	$29.00	$29.00	$29.00	$37.00
Carwheels, Philadelphia	29.00	29.00	29.00	38.00
Heavy steel scrap, P'gh.	29.00	29.00	28.50	42.00
Heavy steel scrap, Phila.	29.00	29.00	29.00	40.00
Heavy steel scrap, Ch'go.	29.00	29.00	29.00	36.00
No. 1 cast, Pittsburgh	29.00	29.00	28.50	36.00
No. 1 cast, Philadelphia	29.00	29.00	29.00	39.00
No. 1 cast, Ch'go, net ton	28.00	27.50	27.00	39.50
No. 1 RR. wrot, Phila.	34.00	34.00	34.00	57.00
No. 1 RR. wrot, Ch'go, net	29.75	29.75	29.75	40.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$6.00	$6.00	$6.00	$15.00
Furnace coke, future	6.00	6.00	6.00	9.50
Foundry coke, prompt	7.00	7.00	7.00	13.00
Foundry coke, future	7.00	7.00	7.00	10.00
Metals:				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	23.50	23.50	23.50	31.75
Electrolytic copper, N. Y.	23.50	23.50	23.50	31.75
Spelter, St. Louis	8.62½	8.37½	7.25	9.00
Spelter, New York	8.87½	8.62½	7.50	9.25
Lead, St. Louis	7.75	7.75	6.92½	11.25
Lead, New York	7.90	7.82½	7.05	11.37½
Tin, New York	92.00	92.00	90.00	62.00
Antimony (Asiatic), N. Y.	13.00	13.00	12.25	19.00
Tin plate, 100-lb. box, P'gh	$7.75	$7.75	$7.75	$12.00

badly in need of charcoal and labor to operate their furnaces, the Government having commandeered nearly all the wood available, while the high market for common labor in the North has compelled Southern blast furnace operators to pay very much higher rates for their common labor or else lose it.

In the Pittsburgh district the rate of pig iron production in June was higher than in a good many months. In spite of the large production, the shortage in supply of pig iron seems to be growing more acute, some consumers stating they have only a few days' supply ahead, and they are wondering whether, when it is used up, a fresh supply will have been received so that they will not have to shut down. The weather has been most favorable for maximum output of pig iron and steel, there having been so far very little real hot weather, which always causes a decrease in production. Practically no complaint is heard about shortage in supply of cars either for receiving fuels for the blast furnaces or shipping finished steel from the mills.

The feature of the market is the continued heavy purchases of steel by the Government for its own use, and also for France. The quantity of finished steel that will be needed in France during the next year is extremely large and is steadily growing. England is also a heavy buyer of pig iron, and other products, so that there seems to be no question that the entire output of steel by the finishing mills this year will be nearly all needed for our own Government and its allies. The scarcity of labor is getting worse, but so far has not seriously restricted steel production. Female labor is being introduced in mills and factories to a constantly increasing extent. This is also true of mercantile lines. The drastic order of "work or fight," effective on July 1, has already caused a great shift in occupations. In this city many men who thought their line of work was exempt from this order have found they were mistaken and have been notified to hunt other jobs at once that are more essential to the conduct of the war.

Pig Iron.—The survey of the pig iron trade started more than a month ago has practically been completed, and at the pig iron meeting last week, allocations were made of the 180,000 tons of basic pig iron for England, Southern furnaces taking 100,000 tons, Northern furnaces 80,000 tons, shipments to be made in September, October and November. It is understood that on a large part of the iron taken by the South, the silicon content was raised to 1.25 per cent and Southern furnaces also have the advantage of contributing to cargoes going from Southern ports. The committee that had in charge the survey of the pig iron trade feels that the ease with which allocations were made for this quantity of pig iron has fully repaid it for the time and labor expended. The survey has also resulted in fully 200,000 tons or more of pig iron being allocated to companies working on strictly war essentials. No new sales of pig iron are being made and all grades are very scarce. No definite system of priority in pig iron is yet in effect, but nearly the entire output of foundry iron is going to foundries working on essentials to the conduct of the war.

Basic pig iron, $32; Bessemer, $35.20; gray forge, $32; No. 2 foundry, $33; No. 3 foundry, $32.50, and malleable, $33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being $1.40 per ton.

Billets and Sheet Bars.—There are practically no billets or sheet bars available for the open market, and this is also largely true of discard steel. The supply of the latter has narrowed very much lately, many companies using it in their own open-hearth furnaces. There is still an acute shortage in supply of sheet bars, and last week one large sheet mill in the Youngstown district was idle for lack of steel, in spite of the fact that the company owning this sheet mill is a large producer

of sheet bars itself, but had to use the steel for war contracts, on which it is filled up for some months. The outlook is that the present shortage in supply of steel will last over all of this year.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $47.50, sheet bars $51, forging ingots $73, and forging billets $60 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Ferroalloys.—Inquiry for ferroalloys of all kinds is limited, consumers being well covered over the remainder of this year. So far there has been very little inconvenience to the steel mills in operations as regards supply of ferromanganese, which seems to be fully large enough to meet all needs. The output of domestic ferromanganese is heavy, and this, with the English material coming in, is fully meeting the demand. The supply of ferrosilicon seems to be larger, and prices are only fairly strong. Several makers of low grade Bessemer ferrosilicon report they are fully sold up for the remainder of this year.

We quote 70 per cent ferromanganese at $250 delivered, 16 per cent spiegeleisen at $65 to $70 at furnace and 50 per cent ferrosilicon for prompt shipment at $160 and for delivery over the last half of the year, $150 to $155 at furnace, the furnaces usually absorbing the freight.

We now quote 9 per cent Bessemer ferrosilicon at $54; 10 per cent, $55; 11 per cent, $58.30; 12 per cent, $61.60. We quote 6 per cent silvery iron, $41; 7 per cent, $43; 8 per cent, $45.50; 9 per cent, $47.50; 10 per cent, $50. Three dollars per gross ton advance for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, these furnaces having a uniform freight rate of $2 per gross ton, for delivery in the Pittsburgh district.

Structural Material.—Some fairly large jobs came out in the past week. The American Bridge Co. took 600 tons for a new steel building for the Cleveland furnace, Cleveland, and 550 tons for buildings for the Gulf Sulphur Co., Texas, while the McClintic-Marshall Co. took 1750 tons for double-tracking viaducts for the Virginian Railroad, and 2000 tons for cantonment buildings at Camp Perry, Ohio. The Government is placing a large amount of structural work for erection in this country and also in France, but few details about this work are given out. A large amount of small steel shapes is being placed by the Government for the 100,000 cars it contracted for some time ago. We quote beams and channels up to 15 in. at 3c. at mill, Pittsburgh, for third quarter.

Plates.—The present output of steel plates is the heaviest ever known in the history of the steel trade, and with a full car supply, the mills are crowding in plates pretty fast on some of the shipbuilding yards, and have been asked to slow down at some points. Output of plates is running at present over 2,500,000 tons per year, and with Government orders already booked and in sight, plate mills are sold up for remainder of this year. We quote ¼-in. and heavier sheared plates for delivery in third quarter at 3.25c. at mill, Pittsburgh.

Tin Plate.—Last week instructions were issued from Washington that no new orders for tin plate are to be accepted by the mills from makers of cans for canning beans, this measure having been taken to conserve the supply of sugar, the ruling to remain in force until September. The fruit and vegetable crop this year promises to be the heaviest ever known, but the tin plate makers believe their output will fully meet the demand for the packing of perishable food. Tin plate mills continue to operate to about 95 per cent of capacity. We quote tin plate for third-quarter delivery, made from Bessemer or open-hearth stock at $7.75 per base box, f.o.b., Pittsburgh. Prices on terne plate for third quarter are given on page 51.

Sheets.—In addition to the heavy orders for blue annealed, black and corrugated sheets placed in the past two weeks by the Government, it is said that fully 100,000 tons more are in sight and will be allocated to the sheet mills by the sub-committee on sheet steel in a short time. Most sheet mills are filled, largely on Government orders for the remainder of this year. Independent sheet mills are not operating to more than 75 per cent of capacity and some at a less rate, owing to the shortage in supply of sheet bars. Prices on sheets for the present quarter are given on page 51.

Wire Rods.—The inquiry for soft and high carbon rods is active, but the supply of rods available for the open market is light. One concern had sold recently several fairly large lots of high carbon steel, for which it reports it received $85 and as high as $90 per ton at mill. There is some export inquiry for rods, largely from Canada, but local makers say they are not quoting on these inquiries as they do not have the rods to spare. Prices on rods for third quarter are given on page 51.

Wire Products.—The order for 7500 tons of annealed wire for third quarter delivery to France, and the order for 10,000 tons of barbed wire for this country will likely be allocated to the mills this week. Local mills say they are running 90 per cent or more on Government direct and indirect orders, and have only a very small part of their output of wire and wire nails available for their commercial trade. The mills are trying to take care of regular customers to the best extent they can, but are not able to give them anything like the quanity of nails and wire they want. Stocks of jobbers are very low, and with orders sent to the mills they must furnish priority certificates in most cases before the mills will enter them. Prices on wire products for third quarter are given on page 51.

Iron and Steel Bars.—Nearly 100 per cent of the output of steel bars is going to the Government on direct and indirect orders, a good part of the bars is being shipped to France for new construction work. The Government demand for iron is not so heavy, and some mills are in position to take orders for delivery later in the year. The Carnegie Steel Co., Jones & Laughlin Steel Co., and other large producers of steel bars are filled up for six months or more. Specifications from the implement trade are fairly heavy, and the steel car builders are also large buyers of steel bars for new car work. We quote steel bars rolled from billets at 2.90c.; from old steel rails, 3c., and refined iron bars, 3.50c. at mill, Pittsburgh, for third-quarter delivery.

Hoops and Bands.—The Government is stimulating the production of oil and rosin as much as possible, and this is creating a very heavy demand for hoops for cooperage purposes. The demand for steel bands is also active, and mills are practically sold up on hoops and bands for the remainder of this year. We quote steel hoops for cooperage purposes, and also steel bands at 3.50c. per lb., f.o.b. Pittsburgh, for third-quarter delivery. Extras and differentials in effect were given in full on pages 1357 and 1374 in THE IRON AGE of May 23.

Cotton Ties.—Consumers are covered on their needs of cotton ties for the remainder of the season, and in spite of the shortage in supply of steel, most makers of cotton ties will roll fully as many this year as last year. We quote cotton ties in lots of 3000 bundles and over at $1.93 per bundle of 45 lb., for July shipment, one cent advance per bundle being charged for August and another cent for September delivery.

Hot-Rolled Strip Steel.—The new demand is only fairly active, but output of hot-rolled strip steel is cut down considerably on account of short steel supply. The Government is taking 75 per cent or more of the limited output on direct and indirect orders. We quote hot-rolled strip steel at $3.50 per 100 lb., f.o.b. Pittsburgh, for third quarter.

Cold-Rolled Strip Steel.—Present output is not running to more than 60 to 70 per cent of normal, on account of the shortage in steel. The Government is still a large buyer of cold-rolled strip steel, part of the material being for shipment to France. We quote cold-rolled strip steel at $6.50 per 100 lb., f.o.b. Pittsburgh, terms 30 days, less 2 per cent for cash in 10 days when sold in quantities of 300 lb. or more. Freight is allowed to destination when it does not exceed 31c. per 100 lb.

Skelp.—Mills are sold up for practically the remainder of this year on skelp, demand for which has been very heavy for a long time. Prices in effect for third quarter are as follows:

We quote grooved skelp at $2.90; universal skelp, $3.15, and sheared skelp, $3.25 base. Special skelp for boiler tubes, etc., is $3.40 for base sizes and $3.55 for other sizes, all prices being per 100 lb., f.o.b. Pittsburgh.

Wrought Pipe.—Mills report the Government is

placing new orders for iron and steel pipe nearly every day and that fully 90 per cent of their product is going to the Government on either direct orders or on orders placed with jobbers. The heavy oil development going on in this country has created a heavy demand for oil wells supply. Mills rolling tubular products are sold up for the remainder of this year, and several of the larger mills practically through the first half of next year. Discounts on iron and steel for present quarter are given on page 51.

Boiler Tubes.—The demand for iron and steel tubes, and also for seamless steel tubing from the Government are very heavy, and recently very large orders have been placed for boiler tubes for locomotives placed by the Government. Makers of iron and steel tubes and seamless tubing are sold up for months. Discounts on iron and steel tubes for third quarter are given on

Coke.—The best indication that a full supply of coke is going to the furnaces is the fact that pig iron output of June in this district showed an increase in daily rate over that of May. Blast furnace operators say there is no longer any trouble in getting a full supply of coke, and in some cases they have been able to accumulate fairly large stocks. Several large users of foundry coke made contracts late in June for their supply for last half of the year at the regular price of $7 per net ton at oven. The Connellsville *Courier* gives the output of coke in the upper and lower Connellsville regions for the week ending June 22 as 344,950 tons, an increase over the previous week of 1980 tons. Prices in effect for third quarter are $6 for furnace coke, $7 for 72-hr. coke and $7.35 for crushed coke from 1-in. size, all in net tons at oven. The Fuel Administrator has fixed maximum prices f.o.b. cars at ovens, in net tons of 2000 lb., for coke made in bee-hive ovens in Cumberland County, Tennessee, at $7.25 for blast furnace and $8.25 for 72-hr. selected foundry coke.

Old Material.—The market as regards supply of scrap by dealers is getting steadily narrower. The railroads, which are large producers of scrap, and also the steel mills that sell scrap, are more and more selling it direct to consumers, thus eliminating dealers. The supply of cars is fairly good, and dealers say they could do plenty of business if they could secure the scrap, but this is impossible, as the supply is very limited. We note sales of 500 tons of compressed terne plate scrap at $23 per gross ton, delivered, 500 tons of detinned scrap at $29 per gross ton, delivered, and 500 tons of borings at $19 delivered, these sales being plus commission of 3½ per cent. Prices on iron and steel scrap in effect for third quarter, most of which have been fixed by the Government for delivery in Pittsburgh, and all consuming points that take Pittsburgh freights are as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered		$29.00
No. 1 cast scrap (for steel plants)		29.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., Franklin, Pa., and Pittsburgh		34.00
Hydraulic compressed steel scrap		29.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mills, Pittsburgh district	$24.00 to	25.00
Bundled sheet stamping scrap	22.00 to	23.00
No. 1 railroad malleable scrap	28.00 to	29.00
Railroad grate bars	18.00 to	19.00
Low phosphorus melting stock (unguaranteed)		34.00
Low phosphorus melting stock (guaranteed)		36.50
Low phosphorus melting stock (bloom and billet ends, heavy plates)		39.00
Iron car axles	46.00 to	46.50
Locomotive axles, steel	46.00 to	46.50
Steel car axles	46.00 to	46.50
No. 1 busheling scrap	28.00 to	29.00
Machine shop turnings	18.00 to	19.00
Cast iron wheels	28.00 to	29.00
Rolled steel wheels	34.00 to	36.00
Sheet bar crop ends (at origin)	34.00 to	35.00
Cast iron borings	18.50 to	19.00
No. 1 railroad wrought scrap	33.00 to	34.00
Heavy steel axle turnings	23.00 to	24.00
Heavy breakable cast scrap	28.00 to	29.00

Shafting.—Government orders are taking fully 85 to 90 per cent of the output of shafting, but jobbers are also buying freely. The demand from the automobile trade is quiet, but from the screw stock machine trade users is fairly heavy. We quote cold-rolled shafting at 17 per cent off in carload and 12 per cent in less than carload, f.o.b. Pittsburgh, for third quarter.

Nuts and Bolts.—Some very large orders for nuts and bolts have lately been placed by the Government, and makers report that fully 85 per cent of their products is being shipped on Government direct and indirect orders. Makers also report the commercial demand very heavy, but say they are not able to fully supply this, owing to so much of their product going to the Government. Discounts on nuts and bolts for third quarter are given on page 51.

Rivets.—It is stated that several of the small makers of rivets have either closed down or else are working on war essentials, stating that present prices of rivets are below actual production cost. The demand for ship rivets is very heavy, and makers are sold up for the remainder of this year. We quote cone-head structural rivets at $4.40 and cone-head boiler rivets at $4.50 per 100 lb.; small rivets, 50 and 10 per cent off list, f.o.b. Pittsburgh, for third quarter.

The Shelby Steel Tube Co., a subsidiary of the United States Steel Corporation, whose works at Ellwood City, Pa., are running entirely on Government orders, has appropriated $800,000 for the erection of houses for its employees. Houses are so scarce in Ellwood City that many employees have been living in tents for some time, and the company desires to see that its employees have warm, comfortable homes. Work on the building of a large number of houses will be started at once.

The LeMoyne Steel Co., general offices in the Park Building, Pittsburgh, and plant at New Eagle, Pa., is now in successful operation. The company will specialize in the manufacture of high-speed steel, the brand being known as LeMoyne high speed steel. With present equipment it will have a capacity of 100 tons a month of high-speed and special tool and alloy steels. The furnace equipment consists of a 3-ton Heroult furnace, and the hammer equipment comprises five hammers, ranging from 4-ton capacity to a 600-lb. tilt hammer for finishing. W. H. Norris, general manager in charge of production, was formerly with the Firth-Sterling Co., where he held successive positions and for the past several years was superintendent of the melting department. E. N. Doty, vice-president, was also for some years associated with a tool steel interest. The officers of the company are D. W. Kuhn, chairman of the board; H. A. Kuhn, president; E. N. Doty, vice-president in charge of sales, and E. W. Strong, sales manager.

Cincinnati

CINCINNATI, July 2.—(*By Wire*).

Pig Iron.—The allocation of iron as far as producers in southern Ohio are concerned is confined almost entirely to basic and has not yet been brought into play on foundry iron except in a very few instances. The furnaces and their distributors are exerting extreme care in seeing that all iron goes to essential industries and while this has not yet caused any appreciable discomfort to melters who are not on this list, there is considerable uneasiness, especially among the stove manufacturers, as to whether they will be able to secure enough metal to carry them through the remainder of the year. According to present information, these manufacturers will not be able to obtain priority orders unless engaged in strictly Government work and they will have to be content in taking iron that is left over after essential industries have been supplied. Just now the outlook is not at all encouraging for them, as little free metal will be available. A realization of this condition has caused a scramble for any odd small lots of off iron that can be had occasionally. Foundry iron production has been cut down considerably, as furnaces able to make basic have been compelled to change over on account of the urgent demand to producing basic iron and to discontinue the manufacture of foun-

dry iron. A large furnace in the Hanging Rock district is now turning out basic entirely.

Based on freight rates of $3.60 from Birmingham and $1.50 Ironton, we quote f.o.b. Cincinnati, as follows:

Southern coke, No. 2 foundry and No. 2 soft	$36 60
Southern Ohio, No. 2	34.50
Basic, Northern	33.50

Finished Material.—The delays in getting priority orders cut down shipments to jobbers, and as a consequence their stocks are running very low. Extreme care is taken by the jobbers not to let any material get into the hands of non-essential concerns. The situation as far as wire goods are concerned is tightening up considerably and only an occasional car load of wire fencing can be secured. There is no barbed wire in stock here except small quantities that a few retail hardware merchants still have on hand. The jobbers are not making any quotations. Wire nails are becoming very much scarcer and one jobber has advanced from $4.20 to $4.25 per keg base, and others are expected to follow suit before the end of the week. The increased freight figures out about a 5c. advance on iron and steel bars and No. 10 blue annealed sheets.

Coke.—Very little complaint is heard regarding the car supply in any district. The principal trouble now confronting the oven operators is in securing sufficient labor in producing and loading the fuel. This is a very serious matter in all districts and is destined to become more acute when real hot weather sets in. Shipments from the Wise County field appear to be moving more freely than from the New River and Pocahontas districts. Shipments from Connellsville are fairly satisfactory and there is little delay en route after the material is forwarded. A few complaints have arisen lately as to the excess moisture in furnace coke, but this is said to be due to the grade of coal furnished out of which the coke is made.

The Fuel Commissioner's warning to coke consumers in this vicinity indicating that action would be taken July 1 to cut off shipments from Wise County, New River and Pocahontas fields to points North of the Ohio River has not yet developed into an order to this effect. Many consumers would hardly know where to turn for a supply if this decree should be put into effect.

Fluorspar.—The movement of fluorspar is heavy and the producers in this vicinity are able to fill orders more promptly than for some time past, although there is considerable complaint as to the labor shortage. Washed gravel fluorspar is quoted for prompt shipment around $30 to $35 for prompt delivery at point of shipment and from $27 to $30 on contracts extending through the remainder of the year.

Old Material.—Scrap is scarcer and with the light offerings from the railroads this condition is believed by the dealers to be one that will become serious before the end of the year. Foundries are consuming more scrap than usual, and with the available supply partly cut off from different sources inroads will be made on yard stocks that will rapidly reduce them. The maximum Government prices have not yet been established on all grades of scrap here, as considerable of this material is shipped to outside points, principally to the Pittsburgh district. This applies especially on cast borings and partially on steel turnings.

The following are dealers' prices, f.o.b. at yards Southern Ohio and Cincinnati:

Per Gross Ton

Bundled sheet scrap	$21.00 to $21.50
Old iron rails	33.50 to 34.00
Relaying rails, 50 lb. and up	44.50 to 45.00
Rerolling steel rails	32.00 to 32.50
Heavy melting steel scrap	27.50 to 28.00
Steel rails for melting	27.50 to 28.00
Old carwheels	28.50 to 29.00

Per Net Ton

No. 1 railroad wrought	$29.00 to $29 50
Cast borings	14.50 to 15.00
Steel turnings	14.50 to 15.00
Railroad cast	25.00 to 25.50
No. 1 machinery	26.00 to 26.50
Burnt scrap	17.50 to 18.00
Iron axles	40.00 to 40 50
Locomotive tires (smooth inside)	35.50 to 36.00
Pipes and flues	21.00 to 21.50
Malleable cast	24.50 to 25.00
Railroad tank and sheet	18.50 to 19.00

Chicago

CHICAGO, July 1—(*By Wire*).

The entire July output of the leading independent mill will be shipped to Japan by Government instructions. With the leading producer the daily average of Government orders continues in excess of shipments. The latter company has 27 out of 29 blast furnaces in operation. The Government is pressing for shell steel from which 75 millimeter shells are made. These facts sum up the situation, there being, in reality "but one customer" and that one the Government. Beginning to-day one large company began billing all shipments on the Pittsburgh base, thereby benefitting from freight differentials.

The situation is not yet entirely clear in respect to supplying jobbers with iron and steel, it being said by some that no authorization has yet been obtained from Washington, and that priority certificates are necessary before stocks will be replenished, even if they have been depleted in supplying demand from an essential or preferred industry. In other words, the mills want full authority and approval before they will divert steel against which there is ample priority to a jobber's warehouse. Foundries are more actively covering their iron contracts with letters of authorization from the War Industries Board.

Consumers having been granted permission to pay the freight, considerable heavy melting and shoveling steel is being shipped to the East from Chicago. Spiegeleisen is in demand, a local interest wanting 500 to 1000 tons.

Pig Iron.—Foundries are more active in applying to the War Industries Board for authorization to receive iron, the desired permission taking the form of letters from the board to the producer concerned, their substance directing that the deliveries requested be expedited. Shipments in general are proceeding at a satisfactory rate. The leading Southern maker of merchant iron is suggesting to all its customers in this district that they obtain the authorization referred to, and it makes the statement that those doing Government work, direct or indirect, need have little fear as to getting iron. Should the Government eventually take over the iron business in its entirety, much confusion will be avoided by the course referred to. Considerable inquiry for small lots of miscellaneous grades is coming out, but the sellers already know where they can place every ton they can find to ship. Melters who have not used low grade iron are now taking it gladly. Some last half Southern iron is yet to be sold, but books have not been opened. The rising cost of making iron is giving rise to complaint over narrow margin of profit. Of 29 furnaces owned by the Steel Corporation in this district, only two are idle. One at South Works of Illinois Steel Co. is being relined.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable, and steel-making irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5	$38.00
Lake Superior charcoal, No. 6 and Scotch	$39.50 to 41.00
Northern coke foundry, No. 1	33.50
Northern coke foundry, No. 2	33.00
Northern coke foundry, No. 3	32.50
Northern high-phosphorus foundry	33.00
Southern coke, No. 1 foundry and No. 1 soft	39.50
Southern coke, No. 2 foundry	38.00
Malleable	33.50
Basic	32.00
Low phosphorus (copper free)	53.00
Silvery, 7 per cent	46.20

Ferroalloys.—Spiegeleisen continues active, the quotation for 16 to 18 per cent being being $75 furnace. A local consumer is in the market for 500 to 1000 tons. The July supply is well nigh absorbed, but August can be had. Standard ferromanganese is quiet at $250 delivered. In ferrosilicon, at $155 to $160, freight allowed, there is no activity.

Plates.—The situation is described by the statement that the entire July output of the leading independent producer will be shipped to Japan by Government direction. The capacity of other mills is absorbed by the Government. The official mill quotation is 3.25c. Pittsburgh, the freight to Chicago being 27c. per hun-

dred. Jobbers quote 4.52c. for material out of warehouse on priority order.

Bars.—Government orders for bars are sufficient to keep the mills engaged for four or five months. The Government is pressing hard for shell steel, especially that used in making 75 millimeter shells used for barrage fire. The course of iron bars continues rather disappointing, although it is hoped that the mill advantage accruing from the new freight differential will create business for the iron bar makers. The demand for rail-carbon bars is greater than the supply of re-rolling rails. We quote mild steel bars at 2.90c. Pittsburgh, iron bars at 3.50c. Chicago, and rail-carbon bars at 3c. Chicago. Jobbers' prices follow:

Soft steel bars, 4.17c.; bar iron, 4.17c.; reinforcing bars, 4.17c., base. No extra charge for twisting ¾-in. and over; 2½c. for twisting ⅝, 11/16, ½ and 9/16; 5c. for 7/16 and ⅜; 10c. for 5/16 and 15c. for ¼-in. Extras as per card are charged for small sizes. Shafting, list plus 13 per cent.

Structural Material.—Shapes are not sold up as far into the future as are plates and bars, but they are difficult enough to secure. Bids have been submitted on the 8700 tons required for the Rush Street bridge, Chicago, but it is not believed the work will be permitted. The American Bridge Co. will fabricate 145 tons of plate girder spans for the C. & E. I. Railway at Milford, Ill., and 114 tons for two 90-ft. deck turntables for the C. R. I. & P. Railway Co. at Burr Oak and Bureau, Ill. The Strebel Steel Construction Co. will fabricate 233 tons for a building, stack and tank for the Western Electric Co., Chicago. The official mill quotation is 3c. Pittsburgh, taking 27c. per 100 lb. freight. Jobbers quote 4.27c.

Sheets.—None is sold except where orders are backed by priority certificates. A few jobbers have obtained shipments on this basis. The local leading independent sheet mill aims to keep its mills running 75 per cent of capacity. We quote No. 28 black at 5c.; No. 10 blue annealed at 4.25c., and No. 28 galvanized at 6.25c., all Pittsburgh. Jobbers quote:

Chicago delivery out of stock, regardless of quantity. No. 10 blue annealed, 5.52c.; No. 28 black, 6.52c., and No. 28 galvanized, 7.77c.

Wire Products.—The leading interest is carefully watching its distribution and taking pains to spread its output as best it can, first looking after the preferred industries and priorities, after which there is but little left. It is made clear to jobbers that they cannot stock up in the ordinary sense. For price, see finished iron and steel f.o.b. Pittsburgh.

Bolts and Nuts.—Orders increase in volume steadily while the prospect of getting raw material grows smaller. Every customer is asked to state if his requirements are for government purposes, and if so, to furnish the priority serial number. So armed, the bolt makers can get the steel. For prices and freight rates see finished iron and steel f.o.b. Pittsburgh, page 51.

Cast Iron Pipe.—Kansas City, Mo., is contemplating the purchase of 2500 tons of 48-in. pipe. The Cleveland inquiry for 600 tons is pending, Manitowoc, Wis., will place 90 tons to-day. We quote per net ton, Chicago as follows: water pipe 4 in., $65.05; 6 in. and larger $62.05.

Rails and Track Supplies.—For tie plates, bolts and track spikes inquiry is more active, light rails continue active, but the standard rail situation is unchanged. We quote:

Standard railroad spikes, 4.11½c., Chicago. Track bolts, with square nuts, 5.11½c., Chicago. Tie plates, steel, 3.25c.; tie plates, iron, 3.75c; f.o.b. maker's mill. The base for light rails is 3c., f.o.b. maker's mill for 25 to 45-lb. sections, lighter sections taking Government extras.

Bolts and Nuts.—Jobbers have revised quotations as follows:

Structural rivets, 5.67c.; boiler rivets, 5.77c.; machine bolts up to ⅞ x 4 in., 37½ per cent off; larger sizes 25 and 5 off; carriage bolts up to ⅞ x 6 in., 22½ off; larger sizes, 20 off; hot pressed nuts, square, tapped, $1.05 off; hexagon, tapped 85c. per 100 lb.; coach or lag screws, gimlet points, square heads, 40 per cent off.

Old Material.—Considerable heavy melting and shovelling steel is now being shipped from this territory to Valley and Ohio points, permission having been granted by the Sub-Committee on Scrap Iron and Steel of the American Iron and Steel Institute for the consumer to pay the freight differential. Low phosphorus scrap, such as couplers and knuckles, steel wheels, springs, etc., heretofore unguaranteed, will now, in accordance with a new ruling, be sold as material containing phosphorous not in excess of 0.06 per cent. The rolling mill grades continue quiet, reflecting the slow operation of the iron mills. Lists have been issued by the Pennsylvania, C. and A., Erie, New York Central and Northwestern, the railroad offerings generally showing an improvement in aggregate quantity.

We quote for delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton	
Old iron rails	$38.00 to	$39.00
Relaying rails	55.00 to	60.00
Old carwheels		29.00
Old steel rails, rerolling		34.00
Old steel rails, less than 5 ft.		34.00
Heavy melting steel		29.00
Frogs, switches and guards, cut apart		29.00
Shoveling steel		29.00
Steel axle turnings		24.00
	Per Net Ton	
Iron angles and splice bars		$34.82
Iron arch bars and transoms		41.50
Steel angle bars	$29.00 to	30.00
Iron car axles		41.52
Steel car axles		41.52
No. 1 railroad wrought	29.75 to	30.36
No. 2 railroad wrought	27.75 to	28.25
Cut forge	27.75 to	28.25
Pipes and flues	24.50 to	25.00
No. 1 busheling	26.25 to	26.75
No. 2 busheling	18.00 to	18.50
Steel knuckles and couplers		30.36
Coil springs		30.36
No. 1 cast scrap	28.00 to	28.50
Boiler punchings	32.00 to	33.00
Locomotive tires, smooth	40.50 to	41.52
Machine-shop turnings	15.75 to	16.25
Cast borings	16.50 to	16.96
Stove plate and light cast scrap	23.00 to	23.50
Grate bars	23.00 to	23.50
Brake shoes	24.00 to	24.50
Railroad malleable	29.50 to	30.30
Agricultural malleable	28.50 to	29.50
Country mixed scrap	21.00 to	21.50

Philadelphia

PHILADELPHIA, July 2.

A new plan has been worked out by the Director of Steel Supply, the steel distribution committee of the American Iron and Steel Institute and officials of the Emergency Fleet Corporation for the distribution of steel to the shipyards, and it is expected that this plan will overcome many of the faults of the present system.

Pig iron distributers are still without definite instructions on shipments of iron, and are following their best judgment as to the consumers who are entitled to receive supplies. Many furnaces will benefit from new coke contracts which become effective July 1, and under which they will obtain coke at $6 per ton instead of $8 or $9, which they have been paying. This saving will offset the higher cost of ore and advanced freight rates on many cost sheets.

Pig Iron.—Foundries not fully engaged in essential work are hustling to obtain orders which will enable them to obtain priority on pig iron shipments. No definite instructions have come from Washington as to preferences to be given on iron shipments, and makers of iron are simply following their best judgment. When any difficulty arises as to the right of a consumer to obtain the iron he has contracted for, the seller merely refers the matter to Washington for settlement. Consumers have need for a great deal more basic iron than they are getting, and it is stated that the War Industries Board will try to increase the production of basic, probably at the expense of foundry grades. In low phosphorus iron, the situation is serious enough to warrant instructions by the War Industries Board that hereafter none of this grade of iron shall be sold without the direct approval of the Director of Steel Supply. Inquiries are also being cut down considerably, a company which recently inquired for about 20,000 tons having been allotted only 12,000 tons. An investigation will be made of every sizable inquiry to

determine whether the quantity asked for is in excess of actual needs. Occasionally a consumer comes into the market for iron for forward requirements, admitting that he has iron on hand for two or three months' work, a large proportion of which is not essential. Such an inquirer is usually advised that he may consider himself fortunate if some of his iron is not commandeered for other plants. There is discussion in the trade as to whether furnaces are justified in asking for a higher price on iron. It is understood, of course, that many of the smaller furnaces have costs which closely approximate selling prices, but a majority of the more efficient furnaces will undoubtedly be helped out by the fact that high-priced coke contracts generally expired on June 30, and new contracts starting with July 1 are on the basis of $6 per ton, Connellsville, instead of $8 to $9, which has been paid throughout the first half. This will mean a saving of $2.50 to $3.75 per ton of iron in many instances, offsetting the additional costs due to the advance on ore and higher freight rates. Not all furnaces will make this saving, as a small percentage have contracts at $8 to $9 running until the end of the year. We quote standard grades of iron f.o.b. furnace, except Virginia iron, for which Philadelphia delivered prices are quoted:

Eastern Pennsylvania No. 1 X	$34.50
Eastern Pennsylvania No. 2 X	33.50
Eastern Pennsylvania No. 2 foundry	33.00
Virginia No. 2 X (including freight)	37.60
Virginia No. 2 foundry (including freight)	37.10
Basic	32.00
Gray forge	32.00
Bessemer	35.20
Standard low phosphorus	53.00
Low phosphorus (copper bearing)	50.00

Coke.—Difficulty has been experienced by a number of furnaces in the past week or two in getting adequate coke supplies. A large number of new contracts at $6, Connellsville, came into effect on July 1. We quote 48-hr. furnace coke at $6 and 72-hr. foundry coke at $7, f.o.b. Connellsville ovens.

Ferroalloys.—A sale of a few hundred tons of spiegeleisen, 16 to 18 per cent, for delivery in the first half of 1919, is the first reported for that period. The price was $75 per ton, f.o.b. furnace, and this quotation continues to rule for shipments over the remainder of this year. Spot spiegeleisen is scarce, but deliveries can be made in August. Ferromanganese, 70 per cent, is firm at $250, f.o.b. furnace, with freight allowed, for any delivery. There is a good demand for ferrotungsten from makers of high-speed steel, and a local seller quotes $2.40 per lb. of tungsten for a grade running 80 to 85 per cent tungsten and low in carbon.

Semi-Finished Steel.—Except for Government allocating orders, there is no activity. We quote 4 x 4-in. open-hearth rerolling billets at $51.30, Philadelphia.

Finished Iron and Steel.—A committee, consisting of J. Leonard Replogle, Director of Steel Supply; James A. Bonner of the American Iron and Steel Institute Committee on Steel Distribution, and Admiral Bowles and M. F. Brown of the Emergency Fleet Corporation, has worked out a new plan for distribution of steel to shipyards. Notification will probably be given to the steel mills this week by the Director of Steel Supply. Under this plan, the shipbuilding companies on the first of every month will send the Emergency Fleet Corporation a list showing the tonnages required for the second month following. That request will then be revised by the Fleet Corporation in consultation with the Director of Steel Supply, and shipbuilders on or about the tenth of each month will be notified how much they will get from each mill. On the twentieth of each month, every shipbuilder must send to the mills chosen to supply him a statement showing in what sizes he wants the tonnage allotted to him rolled. It then becomes the shipbuilding company's business to see that the mill supplies him with these stated requirements. If there is delay, he appeals to the Emergency Fleet Corporation, which, together with the Director of Steel Supply, deals with the matter. By this plan, the shipyards will work with the steel companies somewhat as they did in normal times. It is claimed for the plan that it will obviate the piling up of steel in shipyards in sizes which cannot be immediately used, while sizes urgently needed are not forthcoming as desired. A majority of the steel companies have not yet satisfactorily settled the status of the jobber in steel distribution. Priority certificates have been coming through slowly for the reason, it is explained, that the Priority Committee of the War Industries Board is literally swamped with applications from jobbers. A new method may be devised to take care of the situation, it having been suggested that the jobbers may be permitted to send with their orders an affidavit stating that the steel is for essential purposes only. Presumably steel companies would be permitted to accept these affidavits in lieu of priority certificates. Plates and shell steel continue to absorb a large proportion of the steel in eastern Pennsylvania mills. Makers of bar iron are doing a good business, though limited somewhat by railroad conditions and difficulty in getting raw materials. Deliveries of light bars are being made in from three to four weeks and heavy bars in from four to eight weeks. Makers of bolts and nuts now require about four weeks for deliveries. We quote plates at 3.25c.; plain material at 3c.; soft steel bars, 2.90c.; No. 10 blue annealed sheets, 4.25c.; No. 28 black sheets, 5c.; No. 28 galvanized sheets, 6.25c.; all Pittsburgh. Iron bars are 3.73c., Philadelphia.

Old Material.—New regulations covering unguaranteed low phosphorus scrap and No. 1 cast scrap for foundries and puddling furnaces have gone into effect. Low phosphorus unguaranteed must analyze 0.06 and under in phosphorus and sulphur. By this specification it is expected that sales of material which should be classified as No. 1 heavy melting steel, but which has been sold as low phosphorus unguaranteed, will be prevented. The change in the specifications on No. 1 cast scrap provides that none but strictly first class material may be sold to foundries and puddling furnaces at the maximum price of $34. Second grade material will therefore be sold at a price not exceeding the price of No. 1 heavy melting steel, $29, delivered. Dealers are having difficulty in procuring enough scrap to ship on old orders, and talk of a probable serious shortage within the next few months continues to be heard. We quote for delivery at buyer's plant in eastern Pennsylvania as follows:

No. 1 heavy melting steel	$29.00
Steel rails, rerolling	34.00
No. 1 low phosphorus heavy 0.04 and under	39.00
Low phosphorus, 0.04 and under	36.50
Low phosphorus, 0.06 and under	$32.00 to 34.00
Old iron rails	39.00
Old carwheels	29.00
No. 1 railroad wrought	34.00
No. 1 yard wrought	33.00
Country yard wrought	29.00
No. 1 forge fire	28.00 to 29.00
Bundled skeleton	28.00 to 29.00
No. 1 busheling	31.00
No. 2 busheling	17.00 to 18.00
Turnings (for blast furnace use)	18.00 to 19.00
Machine shop turnings (for rolling mill use)	18.50 to 19.00
Cast borings (for blast furnace use)	18.00 to 19.00
Cast borings (clean)	19.00
No. 1 cast (for steel plant use)	29.00
No. 1 cast (cupola sizes)	33.00 to 34.00
Grate bars	25.00
Stove plate	25.00 to 26.00
Railroad malleable (for steel plants)	28.00 to 29.00
Railroad malleable (for malleable works)	31.00 to 32.00
Wrought iron and soft steel pipes and tubes (new specifications)	33.00
Ungraded pipe	29.00

Birmingham

BIRMINGHAM, ALA., July 1.

Pig Iron.—The hand of the Government in the iron industry is becoming more and more apparent in the allocation of Southern iron. These are coming in regularly through A. H. Woodward, of the Woodward Iron Co., representing the War Industries Board and furnaces are accepting the business as far as they can. It is largely in small lots, but covers the entire country, El Paso, Spokane, Rockford, Ill., and Eddyston, Pa., figuring in orders for 250 to 300 tons. Many specifications call for percentages of manganese which are difficult to execute. Birmingham district plants are making strenuous effort to get on to war work either

in present or adapted form. Pipe works are making new forms of castings for war purposes. Stove plants have taken on orders for cantonments. Making of hand grenades is figured upon. There is little more prospect of an increase in the iron make owing to the continued shortage in coal and coke due to indifference of miners. For instance, a furnace normally averaging 300 tons is making not over 250 tons per diem. Y. Fukumura, assistant manager representing Japanese interests in Talladega furnace, expects to be making iron in the immediate future. It is desired to ship the output to Japan in exchange for shipping. We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry and soft	$33.00
Basic	32.00

Cast Iron Pipe.—Pipe works received several orders from the Government during the week and are looking for orders from gas wells in the Southwest. Large castings are made for Muscle Shoals and other points. Small pipe shops are going into the casting business in order to keep in operation and bid fair to work out extensive plans.

Coal and Coke.—The continued war draft and short hours put in by the men at work militate against a capacity coal output. Many miners have promised to work July Fourth and union mine heads have made another war appeal, with what effect remains to be seen. A great deal of coke intended for 72 hours is pulled at 48 hours in order to meet emergencies.

Old Material.—Shipments on raw material have been very heavy during the past ten days owing to desire to anticipate the advance in freight rates. Cast scrap is marked up slightly. We quote per gross ton, f.o.b. Birmingham district dealers' yards, prices to consumers as follows:

Old steel axles	$35.00 to $36.00
Old steel rails	28.00 to 28.50
Heavy melting steel	25.00 to 26.00
No. 1 railroad wrought	30.00 to 32.00
No. 1 cast	27.50 to 28.50
Old carwheels	29.00 to 29.50
Tramcar wheels	26.00 to 26.50
Machine shop turnings	15.00 to 16.00
Cast iron borings	15.00 to 16.00
Stove plate	23.00 to 23.50

St. Louis

ST. LOUIS, July 1.

Pig Iron.—The demand for pig iron continues as insistent as ever, with no new signs of any relief. The foundrymen and others who have been affected by the Government's action as to pig iron are joining in with the recently developed regional war plant survey under the St. Louis regional chairman and are hopeful that the result will be to turn new business to them from the Government and thus enable them to keep their plants in operation, instead of shutting down as would be necessary if continued on domestic work. The transactions of the week have been few and in small lots, the surpluses of furnace runs not otherwise disposed of.

Coke.—The coke situation shows no new features, the contracts for the new year having been practically disposed of, while by-product plants are sold up on metallurgical coke and there is very little, if any, capacity left on domestic coke production in this immediate vicinity.

Finished Iron and Steel.—In finished products, there have been no new features other than those developed by the Government's revision of prices which has affected the warehouses more than any other interest. The St. Louis warehouses are holding strictly to the lines laid down by the Government and are selling only for vitally necessary replacement or for direct or indirect Government needs, which have to be well established and to pass a "board of censors" in each warehouse. For stock out of warehouse we quote as follows: Soft steel bars, 4.24c.; iron bars, 4.24c.; structural material, 4.34c.; tank plates, 4.59c.; No. 8 sheets, 5.54c.; No. 10 blue annealed sheets, 5.59c.; No. 28 black sheets, cold rolled, one pass, 6.59c.; No. 28 galvanized sheets, black sheet gauge, 7.84c.

Old Material.—The scrap market was brought to a sudden standstill the past week by the announcement of higher rates by the local terminal association, which assumed that the advance authorized applied to that system which operates the transfer facilities at St. Louis and across the river on the East side. This resulted in an advance from 33c. per net ton to $1.30 per net ton for what the scrap dealers have regarded as purely switching service. As a result of this development, the St. Louis Chamber of Commerce and the old material dealers have put the matter up to the traffic manager of the Director General of Railroads at Washington. The contention that the operations of the terminal association within the St. Louis industrial zone are purely switching operations will be fought for very strongly, as the increase will have a very important effect on the scrap business which is very heavy between the east and west sides of the river. Under the new rates, it would be possible to ship scrap to Granite City, Ill., from Kansas City, Mo., nearly 300 miles, almost as cheaply as from St. Louis to Granite City. Under the circumstances detailed, the scrap business came to a standstill in St. Louis and will scarcely be resumed to any extent until an understanding is reached. In consequence the prices quoted are nominal and show no change from last week. No lists came out during the week save one from the Burlington of about 1500 tons. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	$37.00 to $37.50
Old steel rails, rerolling	33.50 to 34.00
Old steel rails, less than 3 ft.	31.00 to 31.50
Relaying rails, standard sections, subject to inspection	55.00 to 65.00
Old carwheels	28.50 to 29.00
No. 1 railroad heavy melting steel scrap	28.50 to 29.00
Heavy shoveling steel	27.00 to 27.50
Ordinary shoveling steel	26.50 to 27.00
Frogs, switches and guards, cut apart	28.50 to 29.00
Ordinary bundled sheet scrap	23.00 to 23.50
Heavy axle and tire turnings	20.50 to 21.00
Per Net Ton	
Iron angle bars	$33.00 to $33.50
Steel angle bars	27.00 to 27.50
Iron car axles	40.00 to 40.50
Steel car axles	40.00 to 40.50
Wrought arch bars and transoms	40.00 to 40.50
No. 1 railroad wrought	28.50 to 29.00
No. 2 railroad wrought	27.50 to 28.00
Railroad springs	29.50 to 30.00
Steel couplers and knuckles	29.50 to 30.00
Locomotive tires, 42 in. and over, smooth inside	37.00 to 37.50
No. 1 dealers' forge	26.00 to 26.50
Cast iron borings	16.00 to 16.50
No. 1 busheling	25.00 to 25.50
No. 1 boilers, cut to sheets and rings	22.50 to 23.00
No. 1 railroad cast scrap	25.50 to 26.00
Stove plate and light cast scrap	21.50 to 22.00
Railroad malleable	26.00 to 26.50
Agricultural malleable	25.00 to 25.50
Pipes and flues	23.00 to 23.50
Heavy railroad sheet and tank scrap	22.50 to 23.00
Railroad grate bars	20.00 to 20.50
Machine shop turnings	16.00 to 16.50
Country mixed scrap	19.50 to 20.00
Uncut railroad mixed scrap	23.50 to 24.00

San Francisco

SAN FRANCISCO, June 25.

At a meeting of the California Foundrymen's Association, held in this city June 18, Emory E. Smith was introduced as the recently appointed Pacific coast commissioner for scrap iron and steel. In his talk Mr. Smith predicted that in the comparatively near future blast furnaces of large magnitude will be constructed on the Coast. He called attention to the fact that the Coast is rich in crude materials, and predicted that coking coal, the lack of which has heretofore kept the industry in its infancy, would soon be available in unlimited quantities from Alaska. The great shipbuilding plants have made it necessary to seek a new source of steel and pig iron for the Coast. Over 80 per cent of the pig iron, he said, was now being used by the Government. In the past this Coast had solved the pig iron problem by the use of scrap. The Pacific Coast is using 36,900 tons of scrap a month, and it

appears that in the immediate future it will be necessary to bring the bulk of this from a distance.

At the same meeting a letter was read from A. F. Pillsbury, District Officer of the United States Shipping Board, Emergency Fleet Corporation, in which he said that in the various steel ship yards in California there are 40 ways for the building of large ships, and that it is probable that this number will be augmented by at least 15 by the first of the year. He added that at present the Pacific Coast is leading the United States in the number of vessels turned out.

Bars.—There has been no change in the market for bars, excepting the more careful conservation of bars for work which is related to the winning of the war.

Structural Materials.—Most of the structural material received in this state is going direct to the shipyards. A large aviation field is being equipped near Sacramento and it is reported that 210 tons of structurals will be used in the buildings.

Plates.—The jobbers are now selling no iron or steel products without a signed statement that its ultimate use is for Governmental purposes. The demand is almost exclusively from the shipyards.

Sheets.—The stock of galvanized sheets in the hands of the jobbers has been reduced to a minimum. As yet no answer has been received regarding giving the jobbers a preferential rating for the purposes of building up a reserve. They are expecting a decision after July 1 which will allow them to keep enough stock on hand to supply immediate demands from the shipyards and small boat builders.

Wrought Pipe.—Sufficient wrought pipe is arriving to satisfy the legitimate demands of the industries which are recognized as essential. Where a demand is made from an industry which is doubtful or known not to be necessary to the main endeavors of the Government delivery is refused.

Cast-Iron Pipe.—The buyers of cast pipe realized that the cost would advance with the increase of freight on June 25 and a number of small orders have been shipped from stock to this coast to anticipate the raise.

Pig Iron.—Most of those who have contracts for pig iron are getting fairly regular shipments. Some of these shipments have been commandeered at the point of shipment, however, and the foundry or mill left to depend on scrap. This is reported to have occurred in one case where the foundry was working directly on a Government contract. This is taken to indicate that future shipments of pig to this market are not to be depended upon and may cease altogether.

Coke.—The coke situation is unchanged. If anything, coke is somewhat harder to get than formerly. No foundry in this section would sell a ton of coke, even to an associate enterprise, unless assurances were given of the immediate repayment.

Old Materials.—The scrap situation is quiescent, awaiting developments from the appointment of the new scrap commissioner. The dealers say that scrap is becoming scarce in this state, and one of the first duties of Mr. Smith will be to investigate the reports that there are many holders of scrap in California who are hoarding the material. He may have to go into the neighboring states and bring scrap from a greater distance than has been the practice in the past. This may mean adjustments of prices to take care of increased haulage charges. It is understood that the Government will extend every facility in the way of supplying cars and forwarding shipments, and it is expected that much good will come from the direct coast management of this material.

M. A. Hanna & Co., Cleveland, have issued as a supplement to their 1918 ore book a table for figuring premiums and penalties based on base prices of Lake Superior iron ore for the season of 1918 on and after July 1, according to the decision reached at the conference of representatives of the ore, iron and steel producers and of the Government in Washington, June 21, and published on page 1686 of THE IRON AGE of June 27.

Buffalo

BUFFALO, July 1.

Pig Iron.—The demand for tonnage for Government work is constantly increasing and rapidly taking up the full capacity of furnace output.

The percentage of output that can be applied on shipments not controlled by specific Government requirements is daily becoming smaller and shipment of iron for use in non-essential industries and for non-war purposes is necessarily being relegated further and further toward the rear. Furnacemen are using the best possible discretion and effort in meeting the Government's wishes for rushing shipment of urgent orders for specific grades, and to forward such portion of product not specifically covered by priorities to apply on contracts shown by questionnaire replies to be needed for important Government work. All but a small number of consumers have now complied with Government instructions and furnished replies to the questionnaires sent out, delinquents having come to a realizing sense of the fact that their supplies of iron will be cut off altogether if information asked by the Government is not furnished without further delay. Price schedules remain unchanged and are as follows, f. o. b. furnace, Buffalo:

No. 1 foundry, 2.75 to 3.25 silicon	$34 50
No. 2 X, 2.25 to 2.75 silicon	33.50
No. 3 foundry, 1.75 to 2.25 silicon	32.50
Gray forge	32.00
Malleable	33.50
Basic	32.00
Lake Superior charcoal, regular grades, f.o.b. Buffalo	37.50

Old Material.—The demand for heavy melting steel still continues to be of large volume and much exceeds the supply, and dealers are finding it very difficult to fill orders. Many dealers incline to the opinion that it is the intention of the Government to take control of and distribute the scrap that is produced by manufacturers that are making shells on Government contracts, and it is currently reported that orders have been given to such manufacturers not to sell their production of scrap for over 30 days' delivery. Apparently action has been taken preventing further selling of shoveling machine shop turnings at prices in excess of the fixed Government price for machine shop turnings, as offers for shoveling turnings which a short time ago were being received for blast furnace and open hearth purposes at Cleveland and Valley points have ceased and such turnings are now going forward to these consuming points at the $19 price. There is no change in the price list of scrap and we continue the current schedule, per gross ton, f. o. b. Buffalo, as follows:

Heavy melting steel	$29 00
No. 1 low phosphorus, heavy, 0.04 and under	39 00
Low phosphorus, 0.04 and under	36.50
Low phosphorus, not guaranteed	34.00
No. 1 railroad wrought	34.00
No. 1 railroad and machinery cast	34.00
Iron axles	$44.00 to 46.00
Steel axles	44.00 to 46.00
Carwheels	29 00
Railroad malleable	34 00
Machine shop turnings	17.00 to 17.50
Heavy axle turnings	24.00
Clean cast borings	18.00 to 19.00
Iron rails	36.00 to 37.00
Locomotive grate bars	24.50 to 25.00
Stove plate	24.50 to 25.00
Wrought pipe	27.00 to 28.00
No. 1 busheling scrap	29.00 to 30.00
No. 2 busheling scrap	21.00 to 23.00
Bundled sheet stamping scrap	21.00 to 23.00

Finished Iron and Steel.—The Government regulations as announced by the War Industries Board through agreement with the American Iron and Steel Institute are becoming better understood and the various concerns that have orders on mill books are endeavoring to classify them so that they will conform to war essential purpose requirements. A good many mills are now requiring customers to secure priority certificates before making any promises of delivery, and the new agreement is having a stimulating effect on the procurement of priorities. Bar mills are receiving allocations of Government tonnage from time to time and one Buffalo mill has just obtained an order for a good-sized tonnage of reinforcing bars for the quartermaster's department. Another local mill has just re-

ceived a heavy tonnage allocation for car plates and canal barge plates. A Buffalo producer of wire and wire nails reports that orders are being received from the Government right along for increasing tonnages of barbed wire and wire nails, so that substantially no output is being sold except for Government work.

British Steel Market

Possible Coal Price Revision May Affect Pig Iron—Tin Plates and Ferromanganese Strong

(By Cable)

LONDON, ENGLAND, July 3.

The home demand for pig iron is sustained by talk of price revision due to an advance of half a crown in the price of coal. The tin-plate market is strong with 32s. 3d. being readily paid. The ferromanganese market is irregular with sales at between $260 to $270 c.i.f. North Atlantic ports. We quote as follows:

Tin plate coke, 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, 32s. 3d.
Ferromanganese, $260 to $270, c.i.f. for export to America; £26 10s. for British consumption.
Ferrosilicon, 50 per cent, c.i.f., £35 upward.
On other products control prices per gross ton are:
Hematite pig iron, East Coast, £6 2s. 6d.; West Coast, £6 7s. 6d.
Cleveland pig iron, £4 15s. for No. 3 and £6 for basic.
Steel plates, ship, bridge and tank, £11 10s.
Steel sheets, black plate, all open annealed, produced in sheet mills, £16 to £18.
Bar iron, standard quality, £13 17s. 6d.; marked, £16.
Sheet and tin plate bars, £10 7s. 6d.
Blooms and billets for rerolling (ordinary), £10 7s. 6d.; special quality, £11.

New York

NEW YORK, July 2.

Pig Iron.—Blast furnace operators and pig iron sellers are slowly systematizing their operations under Government supervision, and while there is still much uncertainty as to methods to be pursued, there is less friction and complaint. Furnace operators who last week thought they might be compelled to go out of business have reached the conclusion that they can worry along for a considerable time. Production of coke includes an unusual amount of low-grade fuel and this is causing considerable off iron. Some selling agents are now receiving Government instructions as to shipments which were formerly sent to the furnaces. Some furnaces and selling agents are receiving very positive and explicit instructions as to shipments, while others are given considerable latitude in making shipments and are allowed to follow their own judgment to a large extent. The new all-rail rate on pig iron from Birmingham, Ala., to New York, is $7.70, an increase of $1.55 over the old rate. No iron is being shipped by rail and water now, as it is impossible to obtain vessel tonnage. We quote prices as follows for tidewater delivery on the basis of the new freight rates on Northern and Southern grades:

No. 1 X	$35.40
No. 2 X	34.40
No. 2 plain	33.90
No. 2 X Virginia	37.90
No. 1 Southern (all rail)	42.20
No. 2 Southern (all rail)	40.70

Ferroalloys.—Demand for domestic ferromanganese is light, but the market is firm at $250, delivered, for 70 per cent alloy plus $4 per unit above this standard. There have been sales at this level of small lots up to 300 tons for early delivery. Importations of British 80 per cent alloy in May were 4138 tons, the largest for any month this year, and indications are that those for June will have been at least 5000 tons. There is a report that there will be later a further modification of the restriction as to an importation of 12,000 tons of British alloy, so that more may be imported. There have been offerings in this market of 80 per cent electrolytic ferromanganese made in Japan, the alloy being already in New York. It is said to contain about 5 per cent silicon and to be low in phosphorus. The spiegeleisen market is strong at $75, furnace, for 16 per cent alloy, plus $3.50 per unit above this standard. A sale of 1000 tons of 18 per cent alloy at $82 per ton, furnace, is reported for early delivery. There have been no sales for 1919 delivery in this market nor any inquiries. The manganese ore situation is reported as somewhat easier. Offerings of Indian high-grade ore have recently brought out quotations no higher than $1.38 per unit, which compares with as high as $1.45 paid in the recent past. One report states that Brazilian ore is now available at about $1.05 per unit, seaboard, but this is regarded as low. Because of labor and railroad troubles and low stocks of ore at ports in India, less ore is expected to be available from that source. Ferrosilicon, 50 per cent, is unchanged at $150 per ton on contract and up to $160 to $165 for spot and prompt. Ferrotungsten is now quoted at $2.40 per lb. of contained tungsten, New York, with the ore concentrates selling at between $20 to $24 per unit in 60 per cent material. We quote ferrovanadium at $4 to $5, Pittsburgh, per lb. of contained vanadium for prompt delivery in small lots, but very little is available, large quantities going into steel on Government orders. Ferro-carbon-titanium, 15 to 18 per cent, is selling at $200 per net ton in carload lots, at $220 per ton in lots between one ton and a carload, and at $250 per ton in lots less than a ton, f.o.b. Suspension Bridge, N. Y.

Finished Iron and Steel.—About 5000 tons of new railroad structural work has come on the market. About the same quantity has been put under contract and considerable other Government work has come to light and bids have been taken on 9000 tons for three piers at the Bush docks, Brooklyn, in connection with the Quartermaster Department storage warehouse. Among the new railroad projects may be mentioned 1600 tons for the Baltimore & Ohio locomotive repair shops at Cumberland, according to plans of Westinghouse Church Kerr & Co.; 2000 tons for the Boston & Maine; 500 tons for the Pennsylvania; 300 tons for the New York Central at 149th Street, New York, and 200 tons for the Central Railroad of New Jersey. This last road was awarded contracts for about 3000 tons, of which 2750 cover a bridge over the Delaware River. The American Bridge Co. will remodel two highway bridges at Providence for the New Haven, involving 1300 tons. The Levering & Garrigues Co. will supply 650 tons of material for a Government pier at Charleston, S. C., and 200 tons for a telegraph building at William and Water streets, New York. The New England Structural Co. will erect a 250-ton machine shop for the Government at Scituate, Mass. What export licenses are obtained seem to cover material for war and war relief needs, even for shipments to Central and South American countries. Some jobbers are restocking on the basis of clear, precise statements of the distribution of their outgo classified according to the preference schedule of the War Industries Board, although as yet some mills still refuse to entertain orders from jobbers under this plan, requiring priority certificates. We quote mill shipments as follows: Steel bars, 3.145c.; shapes, 3.245c.; plates, 3.495c., and bar iron, 3.745c., all New York. Out-of-store prices are 1c. higher.

Cast-Iron Pipe.—In spite of the urgent needs of some municipalities, the orders for cast-iron pipe for public uses other than the Government, are extremely light, due largely to financial reasons. Government buying continues at a liberal rate and cast-iron pipe shops are operating about 75 per cent of their capacity on Government work. Labor shortage is severe. Government prices, including the new freight rate, are as follows: $61.75, New York, for 6-in. and heavier, and $64.75 for 4-in.; $71.75 for 3-in., with $1 additional for Class A and gas pipe.

Old Material.—The new freight rates are having little if any effect on the old material market. Much difficulty is being experienced in making shipments, owing to the delay in obtaining priority orders and in getting cars when these orders are issued. One dealer reports that he found it necessary to have priority orders renewed three times before he could obtain cars to ship two carloads of scrap. The situation in Brooklyn is reported as being especially bad as to cars. We

quote prices of brokers to New York producers and dealers per gross ton, New York, as follows:

Heavy melting steel	$26.20
Rerolling rails	30.80
Relaying rails	$60.00 to 70.00
Iron and steel car axles	43.70
No. 1 railroad wrought	30.80
No. 1 railroad wrought cut to not less than 10 in. or over 24 in.	35.80
Wrought-iron track scrap	28.80
Forge fire	23.50 to 24.00
No. 1 yard wrought long	28.80
Light iron	10.00 to 11.00
Cast borings (clean)	15.30 to 15.80
Machine-shop turnings	15.30 to 15.80
Mixed borings and turnings	15.05 to 15.35
Iron and steel pipe (1 in. minimum diameter), not under 2 ft. long	29.30 to 30.80
Stove plate	22.50 to 23.00
Locomotive grate bars	22.00 to 22.50
Malleable cast (railroad)	30.30 to 30.80
Old carwheels	25.80

Prices which dealers in New York and Brooklyn are quoting to local fundries, per gross ton, are:

No. 1 machinery cast	$34.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	34.00
No. 1 heavy cast, not cupola size	29.00
No. 1 cast (radiators, cast boilers, etc.)	$27.00 to 28.00

Cleveland

CLEVELAND, July 2.

Iron Ore.—Ore shipments for June broke all records for the month, amounting to nearly 10,000,000 tons. Shipments exclusive of the Northwestern Railroad dock at Escanaba, which has not yet reported, aggregated 9,136,000 tons. Figuring the movement from this dock the same as a year ago, the total tonnage for the month would reach 9,800,000 tons, but June shipments from Escanaba were heavier than a year ago.

A meeting of the committee representing all the ore companies was held in Cleveland June 28 to devise an equitable basis for placing in application the price advance of 45c. per gross ton made by the Government effective July 1. It was decided that for ore delivered at lower Lake ports the new price should be applicable from the time of beginning to unload a boat. In other words, if the unloading of a boat was started before midnight of June 30, the old prices would prevail but were the unloading started after midnight, the advanced prices would be charged for the ore. For ore delivered f. o. b., vessel, at upper Lake ports the date of the bill of lading will be used to determine the price. If the bill of lading is dated June 30, the former prices will prevail, but if dated July 1 the advance in price will be charged. Some of the Lake front furnaces buy their ore delivered at upper Lake loading ports instead of delivered at lower Lake docks. Ore delivered f. o. b. mine takes the date of the loading of the cars to determine whether it shall bear the increased price. Some ore going to Northern Michigan furnaces and some manganiferous and silicious ores are sold f. o. b., mine. The ore firms will send to the consumers letters giving a copy of the official order of the Government advancing prices, and the method of applying the price advance as outlined above. In this will also be included the statement that all ore delivered prior to July 1 will be paid for at the old prices and that delivered after July 1 at the new prices. This is in accordance with the general ruling of the Government regarding contracts that are uncompleted when prices are changed. Some furnaces have secured shipments of ore ahead of their schedules and other shipments are behind in their schedules, and the ore companies wish to make clear by this statement that the price is fixed by the time of delivery regardless of whether shipments are ahead or behind. Carrying charges of ore up to Sept. 30 will be $1 free from ports at the head of Lake Superior, 90c. from Marquette, and 75c. from Escanaba, the same as have been prevailing, and the wild ore rates will be at the same figures. Ore prices, f. o. b., lower Lake ports effective July 1 are as follows:

Old range Bessemer, $6.40; old range non-Bessemer, $5.65; Mesaba Bessemer, $6.15; Mesaba non-Bessemer, $5.50.

Pig Iron.—The demand upon the Government for the allocation of pig iron to consumers doing war essential work is increasing from week to week. During the past week, about 35,000 tons were allocated. Of this about 14,000 was Bessemer iron and the remainder was mostly foundry and malleable grades. At present the Committee on Pig Iron, Iron Ore and Lake Transportation has about 50 orders from the Government for allocations, and these will be distributed among the producers as rapidly as possible. Included in these is one for 15,000 tons of basic and others for round tonnages of other grades. All the producers with the exception of five or six have now made their returns on the questionnaire recently sent out by the pig iron committee in the survey of the pig iron industry. These have been unable to complete their returns because information was lacking from some of their consumers, but all the returns are expected to be in this week. Pig iron allocations during the week in lots in excess of 100 tons were as follows: 1350 tons of foundry to a Pittsburgh plant; three lots to the Navy Department for Washington delivery, one 1400 tons of foundry, one 700 tons of foundry, and one 800 tons of low phosphorus iron; 9000 tons of malleable iron to a Michigan City, Ind., plant; 5400 tons of Bessemer iron for Hayes, Pa.; 6600 tons of Bessemer for Paden City, W. Va.; 600 tons of Bessemer for a Coatesville, Pa., steel plant; 1400 tons of malleable iron for an Indianapolis foundry; 9000 tons of basic for a Newark, N. J., plant; 300 tons of foundry for Grenloch, N. J.; 750 tons of 8 per cent silvery iron for the Interstate Foundry Co., Cleveland; 200 tons of foundry for Lewistown, Pa.; 500 tons of foundry for Chicago; 500 tons of Bessemer for Braddock, Pa.; 700 tons of Bessemer for Windsor, Ont.; 500 tons of Bessemer for Erie, Pa.; 600 tons of Bessemer for Pittsburgh; 160 tons of foundry for Spokane, Wash.; 125 tons of foundry for an El Paso, Tex., plant; 500 tons of foundry for Baltimore; 120 tons of foundry for Philadelphia; 150 tons of Bessemer for Newark, N. J.; 350 tons of foundry for New York City; 500 tons of foundry for Indian Orchard, Mass.; 500 tons of low phosphorus for Connellsville, Pa.; and 300 tons of foundry for Warren, Ohio. The new switching rate in Cleveland is 30c. for shipment over one line and 40c. when delivered to a connecting line, this being a 10c. advance in each case. We quote delivered Cleveland, as follows:

Bessemer	$36.60
Basic	33.40
Northern No. 2 foundry	33.40
Southern No. 2 foundry	38.00
Gray forge	32.40
Ohio silvery, 8 per cent silicon	47.90
Standard low phosphorus, Valley furnace	53.00

Finished Iron and Steel.—A great deal of confusion exists in the trade owing to the various Government regulations and modifications thereof respecting the distribution of steel and considerable business is being held up for priority certificates, which possibly are not needed. Mills are attempting to comply with Government rules, but because of different interpretations they are not following uniform methods. Some mills are taking only such orders as are accompanied by priority certificates, and others are accepting orders for essential work without these certificates provided they can make shipments without interfering with priority orders. Jobbers are inquiring for round tonnages, but mills are declining to accept these orders until their customers file reports showing to what purpose steel distributed by them is being put, and they are unable to prepare these reports, as they have not yet been supplied with blanks for making them. Some mills are taking orders for material rolled from shell discard and for hard steel bars for building work without regard to the uses to which it is put and others are requiring priority certificates or assurance that the material is wanted for essential work. The car building program of the Government is bringing out considerable additional steel. The brake-beams have been distributed among several manufacturers, including one Cleveland plant, which is inquiring for 1100 tons of special sections for this work. Another inquiry is for 400 tons of spring steel for cars. In structural work the American Bridge Co. has taken 200 tons for a building for the Cleveland Furnace Co., and local fabricators

are getting a fair amount of small work requiring around 100 tons of steel. Cleveland stove manufacturers and sheet metal working shops are figuring on a new Government inquiry for rolling field kitchens. This order will amount to about $8,000,000. Some of the sheet mills are accepting orders for jobbers with the understanding that they will fill these provided they do not interfere with priority orders. Production in some of the Ohio sheet mills has been curtailed because of the scarcity of sheet bars.

Steel bars, 4.07c.; plates, 4.42c.; structural material, 4.17c.; No. 10 blue annealed sheets, 5.42c.; No. 28 black sheets, 6.42c.; No. 28 galvanized sheets, 7.67c.

Coke.—Cleveland by-product coke, which has been offered for prompt shipment for the past two weeks, has been moving freely, many foundries buying this coke in order to accumulate stock piles, and the supply is now about exhausted. Under the new railroad tariffs, the freight rate on coke from the Connellsville district to Cleveland is increased from $1.75 to $2.20 per ton and the rate on Wise County coke is increased from $2.25 to $2.90 a ton.

Cast Iron Pipe.—Bids for 600 tons of cast iron pipe were received by the city of Cleveland last week. Only two proposals were presented, one from the United States Cast Iron Pipe & Foundry Co., and the other from R. D. Wood & Co. The prices named are $71.60 for 3-in., $64.60 for 4-in., and $61.60 for 6 to 48-in., f.o.b. Cleveland, these being the maximum Government prices.

Bolts, Nuts and Rivets.—Bolt manufacturers are having difficulty in securing an adequate supply of raw material owing to the fact that they are unable to get prompt action on requests for priority certificates, and mills will not ship wire until these certificates are issued. New demand is heavy. Very few bolts are being shipped to jobbers, as manufacturers will not fill jobbers' orders until orders covered by priority certificates are shipped. The American International Shipbuilding Corporation has placed additional orders for 4,000 tons of rivets, dividing this business among four manufacturers. Rivet specifications are very heavy.

Old Material.—A leading Erie, Pa., consumer is inquiring for 10,000 tons of low phosphorous melting scrap, 5000 tons guaranteed and 5000 tons unguaranteed. The demand for both low phosphorus and heavy melting steel scrap is very active and in excess of the supply. But dealers report other grades quiet, although considerable tonnage is apparently being sold directly by producers to consumers. Turnings are plentiful and weak. Cast scrap and busheling scrap are quiet. Some of the rolling mills have shut down for repairs and are holding up shipments on busheling. We quote, f. o. b., delivered at consumers' yards in Cleveland and vicinity as follows:

Per Gross Ton

Steel rails	$27.00 to $28.00
Steel rails, rerolling	34.00
Steel rails, under 3 ft.	34.50
Iron rails	39.00
Iron car axles	46.50
Steel car axles	46.50
Heavy melting steel	29.00
Cast borings	18.00 to 18.25
Iron and steel turnings and drillings	18.00 to 18.25
No. 1 railroad wrought	34.00
Hydraulic compressed sheet scrap	28.00 to 29.00
Cast-iron car wheels, unbroken	29.00
Cast-iron car wheels, broken	34.00
Agricultural malleable	24.00 to 25.00
Railroad malleable	34.00
Steel axle turnings	24.00
Light bundled sheet scrap	24.50 to 25.00
Cast-iron scrap	29.00
Cast-iron scrap, broken to cupola size	31.00 to 32.00
No. 1 busheling	29.75 to 30.50

Per Net Ton

Railroad grate bars	$22.00 to $22.50
Stove plate	22.00 to 22.50

The Youngstown Sheet & Tube Co., Youngstown, Ohio, is installing four new gas producers built by the Morgan Construction Co., Worcester, Mass., to take the place of four other producers to be torn out. The company has lately built four new soaking pits, which are now in operation, two serving No. 1 blooming mill, and the other two No. 2 blooming mill.

IRON AND INDUSTRIAL STOCKS

More Favorable War News Has Stimulating Effect on Stocks

The more favorable news from the battlefronts in Italy and France had a stimulating effect on the stock market during the past week and numerous industrial shares made further progress in the recovery which started some two weeks ago. Some, including United States Steel common, touched the highest quotations reached since the upward movement in May, but there was recession late in the week and, on the whole, the net changes for the week was a slight loss in the case of numerous companies. United States Steel gained only ⅞ of a point and United States Steel, pref., lost ⅛. Other net results of the week were losses as follows: Allis-Chalmers, ½; Baldwin Locomotive, 1¼; Midvale Steel, ¾; Nova Scotia Steel, 3; Pressed Steel Car, ¾; Republic Iron & Steel, ⅜; Sloss-Sheffield Steel & Iron, 1; United Alloy Steel, ⅜. Among the gains of the week were the following: American Car & Foundry, 3⅜; American Steel Foundries, 1¼; Bethlehem Steel, 1⅝; Bethlehem Steel, Class B, 1⅜; pref., 1⅜; eighth pref., ⅝; Crucible Steel, 2⅜; Railway Steel Spring, 1⅝.

The range of prices on active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalm. com.	33 - 34¼	Int. Har. Corp. pf.	96
Allis-Chalmers pf.	83 - 86¼	Lackaw. Steel	83- 85½
Am. Can com.	45 - 47½	Lake Sup. Corp.	17½- 19⅛
Am. Can pf.	93⅞- 94¼	Midvale Steel	51 - 53⅜
Am. Car & Fdry. com.	82¾- 87	Nat.-Acme	30⅜
Am. Loco. com.	66¼- 69¼	Nat. Enam. & Stm. com.	50½- 51⅝
Am. Loco. pf.	99	Nat. Enam. & Stm. pf.	96
Am. Radiat. com.	245 -250	N. Y. Air Brake.	125 -128
Am. Ship com.	129 -131	Nova Scotia Steel	57
Am. Ship pf.	89½	Pittsb. Steel pf.	90
Am. Steel Fdries.	66 - 67⅞	Pressed Stl. com.	65½- 68⅝
Bald. Loco. com.	90½- 95⅝	Pressed Steel pf.	93¼
Beth. Steel com.	86⅝	Ry. Steel Spring com.	56¼- 58⅜
Beth. Steel Cl. B.	82 - 87½	Ry. Steel Spring pf.	98½
Beth. Steel pf.	90	Republic com.	89⅜- 93½
Cambria Steel	135	Sloss com.	62 - 65
Carbon steel com.	122½-133	Superior Steel	42 - 43⅝
Cent. Fdry. com.	48	Un. Alloy Steel.	39 - 40
Chic. Pneu. Tool.	70⅜- 74½	U. S. Pipe com.	14⅜- 16⅛
Colo. Fuel	47¼- 50	U. S. Steel com.	104 -110⅜
Cruc. Steel com.	66⅛- 70⅛	U. S. Steel pf.	110½-112
Cruc. Steel pf.	90½- 91	Va. I., C. & Coke.	71 - 72
Deere & Co. pf.	92⅞	Warwick	8
Gen. Electric	147½-149	Westingh. Elec.	42¼- 44⅝
Gt. No. Ore Cert.	32 -33⅞		
Gulf States Steel.	84½- 85⅝		
Int. Har. of N. J. com.	126½-128		
Int. Har. Corp. com.	65 - 67½		

Largest Business in History of American Car & Foundry Co.

American Car & Foundry Co. has published its pamphlet report for the fiscal year ended April 30, 1918, showing surplus income of $9,181,742, after charges, including taxes and preferred dividends, equal to $30.60 a share on the outstanding $30,000,000 common stock, as compared with $27.36 a share earned in the previous year. The income account compares as follows:

	1918	1917	1916	1915
Total profit	$16,461,823	$17,522,909	$4,595,359	$3,615,054
Ren. rep., etc.	5,180,081	7,212,037	1,779,341	1,284,118
Net	$11,281,742	$10,310,872	$2,816,018	$2,330,936
Preferred divs.	2,100,000	2,100,000	2,100,000	2,100,000
Balance	$9,181,742	$8,210,872	$716,018	$230,936
Common divs.	2,400,000	1,950,000	600,000	600,000
Balance	$6,781,742	$6,260,872	$116,018	$80,936

W. H. Woodin, president, in his remarks to stockholders, emphasized that the gross volume of business done during the 1917-18 year—$121,839,328—was the largest in the history of the company, and that the gross amount of business on the books at the beginning of the new fiscal year was $290,000,000. The company entered upon its new fiscal year with a net working capital of $22,670,175.

Mr. Woodin said, in part: "The changes that have been wrought during the year in the economic and in

dustrial life of our country have been both startling and profound. The whole fabric of our national life has been altered. Precedents no longer rule. Of all the changed conditions, there is none, perhaps, of more far-reaching effect that that which so directly concerns the fundamental industry of your company—the taking over by the Government of the operation of the railroads. While a few months ago there were as many buyers of cars as there were railroads, there is to-day but one—the Director General of Railroads of the United States. That, as a war measure, the taking over by the Government of the facilities of transportation was wise, is not debatable; what its effect will be upon our future industrial life may be a subject of speculation. The Director General of Railroads early recognized the pressing necessity of a very substantial increase in the carrying capacity of the various roads under his control. As a result of this he has contracted for the building of 100,000 freight cars of various types. Of these, an order for 31,000 (the first contracted for by the Director General) has been placed with this company—being the largest single purchase of cars ever made in the history of railroad operation or of car building. This order has been placed on a basis of profit satisfactory to the Government and acceptable to your company, especially in view of the fact that we are relieved by the Government of what would be the heavy burden, under present conditions, of financing the purchase of the material required for this large number of cars."

Government to Aid Niagara Power Companies

Bankers from New York City, Boston, Baltimore, Philadelphia and Buffalo inspected the power plants of the Hydraulic Power Co., the Niagara Falls Power Co. and the Cliff Electrical Distributing Co. at Niagara Falls, N. Y., June 30, with the view of assisting the Government's Capital Issues Committee in financing the increased development of hydroelectric power as a war emergency.

John H. Baker, Baker-Mandeville Co., Buffalo, was in charge of the party, which numbered about 50 and left the Lafayette Hotel, Buffalo, at 10.15 in the morning by special express trolley train for Niagara Falls, after listening to a talk on hydraulic power by Prof. Thomas Conway, Jr., of Columbia University, New York.

Mr. Baker explained that his company and the Spencer Trask Co., New York, are working with the committee to give a wide distribution to the $1,500,000 in bonds which will be issued after the merger of the Niagara Falls power companies is consummated to finance the enlargement of the Hydraulic Canal and for electrical equipment that will add from 66,000 to 99,000 hp. to productive capacity. The companies now develop about 200,000 hp.

Dividends

The Superior Steel Co. quarterly of 1½ per cent on the common stock and a quarterly of 2 per cent on the first and second preferred stocks, all payable Aug. 1.

The Carbon Steel Co. quarterly of 2 per cent, and an extra of 10 per cent on the common stock, payable July 15.

The Pittsburgh Coal Co. 1¼ per cent on the common stock and 1½ per cent on the preferred stock, both payable July 25.

The Pittsburgh Coal Co. of New Jersey, 1¼ per cent on the preferred stock, payable July 25.

The Standard Underground Cable Co. quarterly of 3 per cent on the preferred stock, and an extra of the same amount, both payable July 10.

The Rockaway Rolling Mill, Rockaway, N. J., specializing in the production of bar iron, has been acquired by new interests for a consideration said to be about $500,000. The purchase includes the plant, machinery and equipment, finished and unfinished products and good will. Effective July 1, the new owners will take possession and will operate the plant with a total of about 250 men as formerly employed; the organization in the future will be known as the Rockaway Rolling Mill Co., and was recently incorporated in Delaware. Edward Ehlers, the former president, will not retain any financial interest, it is understood.

SHIPS 300,000 TONS PER MONTH

A Gain Expected in August—Canada's Revival in Shipbuilding

WASHINGTON, July 2.—A total of more than 1,000,000 tons of new ships built in the United States for the Shipping Board up to the end of the fiscal year, which closed on June 30, is foreshadowed by preliminary reports now at hand. The grand total of 1918, up to June 22, was 924,200 deadweight tons. Production is now proceeding at a rate in excess of 300,000 tons per month. It is expected that July will show a very large increase, and that after Aug. 1 there will be a still further gain owing to the completion of additional shipways in several of the large yards. Shipping Board officials confidently predict total construction during the new fiscal year in excess of 6,000,000 tons. Whether Mr. Schwab's hope to build 10,000,000 tons will be realized will depend largely on the extent to which it proves practicable to expand the country's facilities for building engines, boilers and other equipment. Hull construction is no longer regarded as a problem.

The first of the 45 steel vessels to be built in Japan for the United States Shipping Board has arrived in this country, been accepted, and placed in commission under the American flag. It is the Eastern Sun, a cargo carrier of 9066 deadweight tons. Of the 23 steel vessels chartered from Japan by the Shipping Board, 22 to date have been delivered on this side of the Pacific. They total approximately 145,000 deadweight tons.

There has been a notable revival of shipbuilding in Canada during the past year, the output materially exceeding that of the fiscal year 1917. Sixty steel steamers and 52 wooden ships, aggregating about 170,000 tons, and 70 small sailing vessels, are building at 80 different shipyards. Only four of these, however, belong to the Dominion's new program for a fleet of Government-owned ocean-going steel steamers.

The first great difficulty in the way of building steel ships in Canada was the lack of any steel-plate mill in the country. Now, however, by definite arrangement with the Government, the Dominion Iron & Steel Co. is building a $5,000,000 mill at Sydney, Nova Scotia, with a capacity of 150,000 tons of steel plates a year, to provide for shipbuilding requirements.

During the year and a half before this plant is ready to deliver orders, says a bulletin of the United States Shipping Board, the United States Government has enabled the Dominion to obtain sufficient steel for 1918 and 1919, at the same price as paid at the United States shipyards. This co-operation has effected a saving of $7,000,000 to Canada, and has enabled it to "carry on" at still greater capacity for at least another year and a half.

OBITUARY

ARTHUR KEEN, chairman Guest, Keen & Nettlefolds, Ltd., one of the leading steel masters of Great Britain, committed suicide on Thursday, June 27. He had for some time been suffering from a nervous breakdown due to overwork. Mr. Keen was well known to the steel manufacturers of the United States, having visited this country on several occasions, his last trip being in the late eighteen-nineties, when the consolidation movement in the steel industry was well under way. He was at various times a large buyer of semi-finished steel from the Pittsburgh district. In 1900, Mr. Keen as chairman headed a consolidation known as Guest, Keen & Co., Ltd., in which the plants of Guest & Co. (established in 1750), the Dowlais Iron Co. and the Patent Nut & Bolt Co. were brought together. The important bolt and nut interest of Nettlefolds, Ltd., was acquired in 1901, when the company took the name Guest, Keen & Nettlefolds, Ltd. It has been one of the leading British steel interests, having extensive blast furnaces and steel plants in Dowlais and Cardiff, Wales, and at Newport, Monmouthshire.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Effective on and after June 25, 1918, an advance in freight rates of 25 per cent from Pittsburgh on iron and steel articles and also on wrought iron and steel pipe went into effect. The new rates from Pittsburgh on iron and steel articles, in carloads, to points named, per 100 lb. are as follows: New York, 24.5c.; Philadelphia, 23c.; Boston, 27c.; Buffalo, 17c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; minimum carloads, 36,000 lb.; St. Paul, 49½c.; minimum carload, 36,000 lb.; Denver, 99c.; minimum carload, 36,000 lb.; Omaha, 59c.; minimum carload, 36,000 lb.; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, $1.25; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is $1.315, minimum carload 40,000 lb.; and $1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c., minimum carload 46,000 lb.; Denver, 99c., minimum carload 46,000 lb. A 3 per cent transportation tax applies. On iron and steel items not noted above rates vary somewhat and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, structural sizes, 3c.

Wire Products

Wire nails, $3.50 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $3.35 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.25; galvanized wire, $3.95; galvanized barb wire and fence staples, $4.35; painted barb wire, $3.65; polished fence staples, $3.65; cement-coated nails, $3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 47 per cent off list for carload lots, 46 per cent for 1000-rod lots, and 45 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets	$4.40 base
Large boiler rivets	$4.50
7/16 in. x 6 in. smaller and shorter rivets	50-10 per cent off list
Machine bolts h.p. nuts, ⅝ in. x 4 in.:	
Smaller and shorter, rolled threads	50-10-5 per cent off list
Cut threads	50-5 per cent off list
Larger and longer sizes	40-10 per cent off list
Machine bolts c.p.c. and t. nuts, ⅝ in. x 4 in.:	
Smaller and shorter	40-10 per cent off list
Larger and longer	35-5 per cent off list
Carriage bolts, ⅝ in. x 5 in.:	
Smaller and shorter, rolled threads	50-5 per cent off list
Cut threads	40-10 per cent off list
Larger and longer sizes	40 per cent off list
Lag bolts	50-10 per cent off list
Plow bolts, Nos. 1, 2, 3	50 per cent off list
Hot pressed nuts, sq., blank	2.50c. per lb. off list
Hot pressed nuts, hex., blank	2.30c. per lb. off list
Hot pressed nuts, sq., tapped	2.30c. per lb. off list
Hot pressed nuts, hex., tapped	2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank	2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped	2.00c. per lb. off list
Semi-finished hex. nuts:	
⅝ in. and larger	60-10-10 per cent off list
9/16 in. and smaller	70-5 per cent off list
Stove bolts	70-10 per cent off list
Stove bolts	2½ per cent extra for bulk
Tire bolts	50-10-5 per cent off list

The above discounts are from present lists now in effect.

All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $57; chain rods, $65; screw, rivet and bolt rods and other rods of that character, $65. Prices on high carbon rods are irregular. They range from $70 to $80, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16 in. x 4½ in. and heavier, per 100 lb., $3.90, in lots of 200 kegs of 200 lb. each, or more; track bolts, $4.90. Boat spikes, $5.25 per 100 lb., f.o.b. Pittsburgh.

Terne Plate

Effective May 21 prices on all sizes of terne plates are as follows: 8-lb. coating, 200 lb., $15 per package; 8-lb. coating, I. C., $15.30; 12-lb. coating, I. C., $17.00; 15-lb. coating, I. C., $18.00; 20-lb. coating, I. C., $19.60; 25-lb coating, I. C., $20.60; 30-lb. coating, I. C., $21.75; 35-lb. coating, I. C., $22.75; 40-lb. coating, I. C., $24.00 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.90c. from mill, and 4.50c. to 5c. from warehouse in small lots for prompt shipment. Refined iron bars, 3.50c. in carload and larger lots, f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, as announced Nov. 5 by the Government on steel pipe, those on iron pipe being the same as quoted for some time:

Butt Weld

Steel: Inches	Black	Galv.	Iron: Inches	Black	Galv.
⅛, ¼ and ⅜	44	17½	⅛ and ¼	23	+4
½	48	33½	⅜	24	+3
¾ to 3	51	37½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	44	31½	1¼	18	3
2½ to 6	47	34½	1½	25	11
7 to 12	44	30½	2	26	12
13 and 14	34½	..	2½ to 6	28	15
15	32	..	7 to 12	25	12

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	40	22½	⅛, ¼ and ⅜	23	5
½	45	32½	½	27	14
¾ to 1½	49	36½	¾ to 1½	33	18
2 to 3	50	37½			

Lap Weld, extra strong, plain ends

2	42	30½	1¼	19	4
2½ to 4	45	33½	1½	25	11
4½ to 6	44	32½	2	27	14
7 to 8	40	26½	2½ to 4	29	17
9 to 12	35	21½	4½ to 6	25	16
			7 to 8	20	8
			9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh, announced Nov. 13, as agreed upon by manufacturers and the Government:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	34	3½ to 4½ in.	12½
2½ to 3¼ in.	24	3 to 3¼ in.	+ 5
2¼ in.	17½	2½ to 2¾ in.	+ 7½
1¾ to 2 in.	13	2 to 2¼ in.	+22½
		1¾ to 1⅞ in.	+35

Standard Commercial Seamless—Cold Drawn or Hot Rolled

	Per Net Ton		Per Net Ton
1 in.	$340	1¾ in.	$220
1¼ in.	280	2 to 2½ in.	190
1⅜ in.	270	2¾ to 3¾ in.	180
1½ in.	220	4 in.	200
		4½ to 5 in.	220

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots, are as follows:

	Cents per lb.
Blue Annealed—Bessemer	
No. 8 and heavier	4.20
Nos. 9 and 10	4.25
Nos. 11 and 12	4.30
Nos. 13 and 14	4.35
Nos. 15 and 16	4.45
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	4.80
Nos. 22 and 24	4.85
Nos. 25 and 26	4.90
No. 27	4.95
No. 28	5.00
No. 29	5.10
No. 30	5.20
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	5.25
Nos. 12 and 14	5.35
Nos. 15 and 16	5.50
Nos. 17 to 21	5.65
Nos. 22 and 24	5.80
Nos. 25 and 26	5.95
No. 27	6.10
No. 28	6.25
No. 29	6.50
No. 30	6.75
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	4.80
Nos. 17 to 21	4.85
Nos. 22 to 24	4.90
Nos. 25 and 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.05
Nos. 30½ and 31	5.10

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
June	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
26	23.50	23.50	*92.00	7.90	7.75	8.62½	8.37½
27	23.50	23.50	*92.00	7.90	7.75	8.62½	8.37½
28	23.50	23.50	*92.00	7.90	7.75	8.75	8.50
29	23.50	23.50	....	7.90	7.75	8.75	8.50
July							
1	23.50	23.50	*92.00	7.90	7.75	8.87½	8.62½
2	23.50	23.50	*92.00	7.90	7.75	8.87½	8.62½

*Nominal.

NEW YORK, July 3.

The markets are all strong, but none of them are particularly active. Copper producers expect an early ruling on prices, possibly this week. Tin is very quiet again, with offerings very light. Lead is still very strong, with prices fixed by agreement among producers. Spelter continues strong and higher. Antimony is dull and unchanged.

New York

Copper.—Quite unexpectedly copper producers were summoned to Washington for a meeting yesterday afternoon with the War Industries Board. When the price question was settled at the meeting, late in June, and the present price continued until Aug. 15, it was not expected that the matter would come up officially again until Aug. 7, the date of the next scheduled meeting. It is understood that the meeting this week is the Aug. 7 meeting moved forward. Just what subjects were discussed or decided is not known at this writing. It is generally believed by many that the new freight rates and other considerations have necessitated an earlier discussion and that the result will be an advance in the price to 25c. per lb. Demand continues very large at 23.50c. per lb., the fixed price, and it is stated that producers are in arrears in May deliveries.

Tin.—The market is again very slow and quiet, due to lack of offers. Buyers have shown considerable interest the past week, covered by this report, but they have been unable to get what they wanted. One large dealer says that there have been no offerings of Straits tin in the last seven days. The statement of the leading mining paper that licenses to ship English Lamb and Flagg tin have been suspended has not been confirmed, but it is believed that there is something to it. There is a dearth of offers of all kinds of tin and this has checked business. There continues to be talk of price-fixing, but so far nothing definite has come out. It may develop into some regulation and it may not. Deliveries of tin for June are reported to have been 998 tons at Atlantic ports and 5784 tons at Pacific ports, a total of 6782 tons. The quantity in stocks and landing on June 30 was 95 tons. The June deliveries are large and compare with a little over 5000 tons in March and April respectively. The May deliveries were 4056 tons. The London market is only 10s. above that of last week, or £332 10s. per ton for spot Straits.

Lead.—An advance in the New York price from 7.82½c. to 7.90c. per lb. was made by the American Smelting and Refining Co. early last week with the St. Louis price unchanged at 7.75c. per lb. This is regarded merely as an adjustment because of the new freight rates. The 7.90c. price has evidently been fixed by leading producers in a determined effort to prevent the market from going to premium prices. There is a little metal in the hands of speculators which is commanding a higher price, but this is expected to soon disappear. Very little lead in general is being offered, but what is released is going at 7.90c., New York. The agreement as to a price by the producers is, of course, a movement to forestall and avoid a fixed price by the Government. Supplies are hardly equal to demand.

Spelter.—There have been large sales of Grade C and prime Western spelter to the Government in the last week or two, aggregating probably 10,000 tons. The largest part of this went to the ordnance department of the army, but at what price is not made public. The Navy also bought 1000 tons of Grade B and 500 tons of Grade C, which are reported to have brought 9.75c. and 8.36c. per lb. respectively. Large buying by the British Government is rumored. The market continues strong and has advanced further in the week. There was a sale of 1000 tons of prime Western on Monday and other smaller sales are noted at 8.62½c. per lb., St. Louis, for early delivery. The market is quoted at 8.62½c. per lb., St. Louis, or 8.87½c. per lb., New York, for July, with a slight premium asked and obtained for August-September delivery. It is believed that the upward movement has about reached its height and that the market will ease off slightly, for a time, at least, due to the large Government buying and to the fact that there will be freer offerings as a result. One producer was quoting 8.50c., St. Louis, yesterday, for July delivery.

Antimony.—The market is quiet and unchanged at 13c. to 13.25c. per lb., New York, duty paid, for prompt and early delivery.

Aluminum.—Maximum prices, established by the Government, rule the market for No. 1 virgin metal, 98 to 99 per cent pure, at 33c. per lb. for 50-ton lots, 33.10c. per lb. for lots of 15 to 50 tons and 33.20c. per lb. for lots of 1 to 15 tons.

Old Metals.—The market is very quiet. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible	23.50
Copper, heavy and wire	23.50
Copper, light and bottoms	21.00 to 21.50
Brass, heavy	16.00 to 16.25
Brass, light	11.25 to 11.75
Heavy machine composition	24.25 to 24.75
No. 1 yellow rod brass turnings	13.00 to 13.50
No. 1 red brass or composition turnings	20.50 to 21.00
Lead, heavy	7.25
Lead, tea	6.25
Zinc	6.25

Chicago

July 2.—Copper is pursuing a routine course, regular customers being kept supplied, despite an occasional tightness in supply. Tin is stronger, with futures especially hard to get. July and August tin shows a wide range, August, for instance, being quoted at from 80c. to 96c. per lb., according to grade. Lead is more tightly held as a result of the effort to put it on an official maximum basis, the proposed price being 7.75c. per lb., St. Louis, and 7.90c. per lb. New York. Sellers are few and the situation is not regarded as healthy. Spelter is firm, but quiet. Offerings of antimony are free. We quote copper at 23.50c. for carloads and 24.67½c. less than carloads; tin, 95c. to $1; lead, 7.87½c. to 8.12½c.; spelter, 8.62½c. to 8.75c.; antimony, 14c. to 15c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 21c.; copper clips, 21c.; copper bottoms, 19c.; red brass, 21c.; yellow brass, 14c.; lead pipe, 6c.; zinc, 5.50c.; pewter, No. 1, 55c.; tinfoil, 65c.; block tin, 70c.

St. Louis

July 1.—The non-ferrous metals have been stronger on the market during the past week, with lead, car lots, closing to-day at 7.75c.; spelter, 8.60c. In less than car lots, the quotations are: Lead, 8.25c. to 8.50c.; spelter, 9.35c. to 9.50c.; tin, $1.10; copper, 23.12½c.; Asiatic antimony, 15c. In the Joplin district, both zinc and lead ore prices were stronger and the lowest for zinc blends was $47.50 to $50 per ton, basis of 60 per cent metal, these being second grade quotations, with the top grades selling, as usual, since the agreement, at $75 per ton, with the average for the week, because of the small quantity of top grade ores sold, running down to $51 per ton. Lead was very strong, with apparently not enough being produced to meet the demand, and the price, basis of 80 per cent metal, was pushed up to $95 per ton, with the average for the week for the district at $94 per ton. Calamine

was steady and strong at $30 to $34 per ton, with the average for the week for the district at $32 per ton. On miscellaneous scrap metals, we quote dealers' buying prices as follows: Light brass, 10c.; heavy yellow brass, 14c.; heavy red brass and light copper, 19.50c.; heavy copper and copper wire, 20c.; zinc, 5c.; lead, 5.50c.; tea lead, 5c.

Ordnance Board for Neville Island Gun Plant

The War Department has announced the organization of a special board of ordnance experts to have charge of the new Neville Island gun and projectile plant of the United States Steel Corporation in co-operation with the officials of the latter.

Col. Charles C. Jamieson, who was for four years in charge of manufacturing at Watervliet Arsenal, Watervliet, N. Y., later with Deere & Co., Moline, Ill., and recently head of the engineering firm with which General Goethals was associated, is president of the board. Serving with him will be Col. Charles M. Wesson, in charge of manufacturing at the Watertown Arsenal, Watertown, Mass.; Lieut.-Col. W. P. Barba, for 37 years was with the Midvale Steel & Ordnance Co., finally as vice-president and general manager; Lieut.-Col. H. B. Hunt, who has had a long experience in manufacturing; Lieut.-Col. F. E. Walters, Lieut-Col. R. P. Lamont and Major Charles A. Walker, Jr. Colonel Lamont is president of the American Steel Foundries. Colonel Walters is a construction engineer. Major Walker has been in charge of ordnance work at Watervliet Arsenal. Major A. B. Hubard, formerly ordnance engineer for the Midvale Steel & Ordnance Co., will be consulted in the purchase of machine-tool equipment.

The board will represent the Ordnance Department in the preparation and approval of plans for the construction of the Neville Island plant under the terms of the contract between the United States Steel Corporation and the Ordnance Department.

A. M. Castle & Co. of Washington

On July 1 the business previously conducted by the Western Hardware & Metal Co. at Seattle, Wash., and that of A. M. Castle & Co. in the Pacific Northwest passed to A. M. Castle & Co. of Washington. The entire organization and warehouse facilities of the Western Hardware & Metal Co. were taken over by the new company, which was organized with a capitalization of $1,500,000. The firm of A. M. Castle & Co. was founded in 1890, with headquarters in Chicago, and has grown to be one of the important iron and steel jobbing houses of the country. The Western Hardware & Metal Co. was established 12 years ago by George Boole.

The new company will specialize on plates, black and galvanized sheets, structural shapes, iron and steel bars, rivets, bolts, pipe, hoops and bands. In addition it will continue to carry a stock of chain, shovels, wheelbarrows, blowers, gages, valves, waste, etc. It is the intention also to enlarge the activities of its predecessors in Pacific Coast territory and in foreign countries.

The principal offices of A. M. Castle & Co. of Washington will be located at 1201 First Avenue South, corner Connecticut Street, Seattle. The officers are: George Boole, Seattle, chairman of the board of directors; W. B. Simpson, Chicago, president; L. M. Henoch, Chicago, secretary; H. Erskine Campbell, Seattle, treasurer; George Warren Boole and Frank J. Speckert, Seattle, and Roy L. Sanford, San Francisco, vice-presidents.

Larger Ferromanganese Imports in May

Ferromanganese imports in May were 4138 gross tons, the largest for any month this year, those for March having been 3555 tons. The total to June 1 has been 12,735 tons, or an average of 2547 tons per month, which compares with a monthly average in 1917 of 3703 tons. Most of the May imports were received as follows: 1449 tons through the port of Baltimore, 1304 tons through Philadelphia, and 1000 tons through New York.

TO MOBILIZE UNION LABOR

One Plan Suggested to Meet Need of Machinists, the Other Covering Drafted Men

WASHINGTON, July 2.—Evidence that the shortage in machinists has reached a critical stage and that the ordinary sources of supply of this type of skilled labor have been drained dry has been accumulating during the past few weeks, according to a bulletin just issued by the United States Employment Service. To meet urgent Government needs in this requirement two new avenues of approach are being followed by the United States Employment Service pending the time when the recruiting and distribution of all skilled labor engaged on war contracts will be centralized exclusively with the Federal employment service. These developments are:

> Mobilization by the International Association of Machinists, affiliated with the American Federation of Labor, of its entire membership for war work.
>
> Consideration by the War Department of the advisability and feasibility of placing in deferred classification all skilled machinists registered for the draft and of furloughing for important war work men of this type already in the cantonments.

While the question of furloughing machinists in the Army is still under consideration, the International Association of Machinists is going rapidly ahead on the task of registering men in that trade in order that the whole power of the organization may be concentrated on war work. William J. Murphy, a former officer of that organization, and recently enrolling agent of the Public Service Reserve at Springfield, Mass., has been assigned by the Federal employment service to headquarters of the International Association of Machinists in Washington to assist in producing results where men are needed quickly in various parts of the country.

E. C. Davison, general secretary-treasurer of the International Association of Machinists, has sent circulars to every local of the organization, inclosing blanks to be filled with the following information:

> The number of skilled machinists, members of the local branch, now serving in the Army or Navy, thus giving a line on the reserve available from this source, if necessary.
>
> The number of machinists in each local engaged in industries non-essential to the success of the war; also estimates of the number of non-union men in each locality engaged in non-essential industry.
>
> A list of the non-essential industries in each locality, both union and non-union, including registrations which will be made of all machinists and toolmakers in these plants.

Blanks are being furnished every local of the association for the registration of every machinist and toolmaker of draft age, with a view to possible deferred classification.

Duplicate copies of all this information will be furnished to the Public Service Reserve of the employment service and will form a valuable part of the information to be employed in redistributing machinists to meet essential needs.

Redistribution of machinists not now engaged in work directly connected with the prosecution of the war is declared to be a present and not a future need. Proof of this is the fact that the Government arsenals alone are to-day short from 3000 to 4000 skilled machinists and toolmakers. Three industrial states in the East estimate their need for machinists at 80,000. Prompt action must be taken to meet the requests for this type of skilled labor which are reaching the United States Employment Service daily.

To obtain success in the redistribution wholehearted and self-sacrificing co-operation is asked of manufacturers not engaged in essential production. Real patriotic service can be rendered by those employers who willingly submit to a possible loss of efficiency in their plants by personally assisting the transfer of their skilled machinists to vital war work.

Adding machines will be the product of the Mays Mfg. Co., Lexington, N. C., incorporated with a capital of $2,500,000 by Lexington manufacturers.

PERSONAL

E. J. Frost, president of Frost Gear & Forge Co., manufacturer of gears and forgings, Jackson, Mich., was elected president of the American Drop Forge Association at its annual meeting held at Buffalo, June 20 and 21. He is also active in the affairs of the American Gear Manufacturers' Association, and at its recent meeting in White Sulphur Springs was elected a member of the executive committee. He is a member of the American Society of Mechanical Engineers.

E. J. FROST

Henry J. Schlesinger, vice-president and treasurer Milwaukee Solvay Coke Co. and numerous other industries included in the Ferdinand Schlesinger group, with headquarters in the First National Bank Building, Milwaukee, has accepted a commission as a captain in the Ordnance Corps, United States Army, and will report for duty at once. He is a son of Ferdinand Schlesinger and has been closely associated with his father and his brother, Armin A. Schlesinger, in the management of the extensive iron mining, blast furnace, coke and gas and chemical industries which they control.

Joseph H. Frantz, vice-president and general manager Columbus Iron & Steel Co., Columbus, Ohio, and vice-president Ohio Manufacturers' Association, has been appointed Fuel Administrator for Ohio, succeeding Homer H. Johnson, Cleveland, resigned.

Hugh M. Condie, traffic manager of Warren Webster & Co., Camden, N. J., has resigned, to become commercial office manager of the Swedish Iron & Steel Corporation of New York and Brooklyn.

George Westbrook, president Noble & Westbrook Mfg. Co., Hartford, Conn., has been elected a member of the executive committee of the National Stamp Manufacturers' Association.

The Latrobe Electric Steel Co., Latrobe, Pa., has opened an office in Cleveland, at 1306 Union National Bank Building, and has appointed as district sales manager Percy W. Fenner, who is well acquainted with the trade, having sold the Jessop steeels of William Jessop Sons, Inc., in the Cleveland territory for several years.

D. T. Williams, founder of the D. T. Williams Valve Co., Cincinnati, but who has not been connected with that company for some time, has accepted an official position with the Cleveland Gas Burner & Appliance Co., Leader News Building, Cleveland. He assumed his new duties July 1.

T. H. Aldrich, Sr., a pioneer iron and coal operator, has been chosen regional director of the thirteenth industrial zone, with headquarters at Birmingham, Ala., and will have as sub-chiefs, constituting an executive board, representatives from Tennessee, Missippi, and sections of Florida and Louisiana, included in the Birmingham zone.

Harry Du Bois, who has been in charge of sales of ferromanganese and spiegeleisen for E. J. Lavino & Co., Bullitt Building, Philadelphia, has joined the War Industries Board in Washington for the duration of the war.

Robert M. Gregory, for 12 years actively engaged in the manufacturing end of the automobile industry, has been placed at the head of the purchasing department of the Lane Motor Truck Co., Kalamazoo, Mich. Mr. Gregory started in his line with the Maxwell-Briscoe Co. in 1906, and has held responsible positions with the Chalmers Motor Car Co., General Motors Co., Hupp Motor Car Corporation, and the Packard Motor Car Co.

Charles B. Wilson, president and general manager of the Wilson Foundry & Machine Co., Pontiac, Mich., is a new "dollar-a-year" man in Government service, having been named assistant manager of aircraft production and placed in charge of the airplane production at the Curtiss Airplane & Motor Corporation's plant in Buffalo, the largest airplane-producing concern in America. Mr. Wilson retains his connections with the foundry company in Pontiac.

W. T. Summers, president of the Merchants' National Bank, San Francisco, has been elected vice-president, and W. L. Booth, formerly assistant manager, general manager of the Judson Mfg. Co., succeeding W. D. Bunker, resigned.

F. J. Nicholas has resigned as treasurer and purchasing agent of the Sandusky Foundry & Machine Co., Sandusky, Ohio, to accept a position with the Calumet & Heckla Mining Co., Calumet, Mich.

D. O. Rice, formerly in charge of the Cleveland office of the Whitaker-Glessner Co., Wheeling, W. Va., has been transferred to the Cincinnati office to succeed A. F. Scherer, Cincinnati district sales manager, who recently resigned to accept a position as production supervisor in the Ordnance Department of the Army, with headquarters in Cincinnati.

Henry F. Jordon, for six years Pittsburgh sales manager of the Braeburn Steel Co., and previous to that with the Colonial Steel Co. in various capacities for five years, has been made general sales manager of the Braeburn Steel Co., succeeding Frank P. Case, resigned.

Charles Hubbard & Co., 81 Fulton Street, New York, announce that they are the New York representatives of the Sterling Steel Foundry Co., producer of large open-hearth steel castings. Specialties at the present time are hull castings such as stern frames, rudders, etc., as well as marine engine castings.

William E. Baer, formerly of New York, has been appointed auditor for the Government in connection with the Neville Island plant to be built by the United States Steel Corporation, and has offices in the Union Arcade, Pittsburgh. His duties will consist of checking accounts with the auditors of the Steel Corporation before approving them for payment by the Government.

Charles R. Hook, vice-president, American Rolling Mill Co., Middletown, Ohio, and in charge of the operating department, has been appointed a director of the company to succeed the late James G. Battelle, former president of the Columbus Iron & Steel Co., Columbus, Ohio, which was absorbed last year by the American Rolling Mill Co. Mr. Hook's connection with the American Rolling Mill Co. commenced as night superintendent of the Central Works 14 years ago, since which time he has been promoted through the offices of assistant general superintendent, general superintendent, vice-president, in charge of the operating division and now a director in the company.

CHAS. R. HOOK

Major L. J. Campbell, vice-president of the Youngstown Sheet & Tube Co., Youngstown, Ohio, and a son of J. A. Campbell, president, has arrived in France. Major Campbell received his training at Fort Benjamin Harrison last year, and is now in the artillery service.

LABOR TAKEN FOR WAR PLANTS

United States Employment Service Asks Less Essential Industries for Men

Methods by which the United States Employment Service will take labor from the less essential industries for the benefit of plants engaged in war work were illustrated last week in Long Island City, N. Y., when a conference with manufacturers was held at the Queens Chamber of Commerce. Those in the less essential industries were informed that their plants were to be levied upon to supply 10,000 workers needed by the Wright-Martin Aircraft Corporation, which is building Hispano-Suiza airplane motors, and by the Gas Defense Plant of the United States Army, which is making gas masks for soldiers.

John R. O'Leary, national superintendent of labor for the New York district, explained that there are just two things for manufacturers to do when called upon to give up a part of their labor. The first is to go into the factory and decide what employees are not absolutely essential and send them to the Government plants. The second thing is to discover what additional female labor is to be had. Manufacturers will be expected to give up some of their male labor and fill the men's places with women.

It was explained at the New York office of the United States Employment Service, 22 East Twenty-second Street, that it is not the intention of the department to commandeer labor in a drastic manner. The needs of certain war plants in a community are first carefully tabulated, and then a list of the less essential plants, with the number of workers they employ, is also tabulated. After a careful investigation, the approximate number of skilled and unskilled workmen which each plant should be asked to give up is determined, and the various manufacturers are approached individually, or a conference is called, at which the plan is explained.

Even plants engaged upon war work may eventually be levied upon for the benefit of others. Where they have a large force of skilled workmen, they will be asked to dilute their forces with women, and give up some of their skilled men to other plants.

The United States Employment Service has started a campaign to obtain 300,000 to 400,000 additional laborers and a large number of machinists and other skilled workers. The Department of Labor announces that there is a shortage of 300,000 common laborers in the vital industries and that war plants in Connecticut and Maryland alone are in need of 35,000 skilled machinists. In many plants, work on guns and munitions is being delayed by lack of skilled and unskilled workers.

Federal Planners for Neville Island Plant

The Acting Chief of Ordnance, Brig. Gen. C. C. Williams, has announced the personnel of the Ordnance Department board that will work with United States Steel Corporation officials in the building of the Neville Island gun and projectile plant. Col. Charles C. Jamieson will be president of the board. Serving with him will be Col. Charles M. Wesson, Lieut. Col. H. B. Hunt, Lieut. Col. W. P. Barba, Lieut. Col. F. E. Walters, Lieut. Col. R. P. Lamont, and Maj. Charles A. Walker, Jr. This board will represent the Ordnance Department in the preparation and approval of plans for the construction of the Neville Island plant, under the terms of the contract between the United States Steel Corporation and the Ordnance Department. The appropriation for the work is $40,000,000. It is stated that plans for construction are well advanced and that purchases of equipment have been begun.

The Crucible Steel Co. of America, South Fourth Street, Harrison, N. J., has awarded a contract to W. H. & F. W. Cane, Woolworth Building, New York, for the construction of a new one-story, brick and steel rolling mill, about 200 x 400 ft., to cost $500,000.

COKE DISTRIBUTION

New Regulations Issued—Operator Compelled to Donate to Red Cross

WASHINGTON, July 2.—The United States Fuel Administration has issued additional regulations to be put in force for the better control of coke distribution and fixing prices at which coke may be sold.

The new orders, which are now effective, provide that the maximum price f.o.b. cars at ovens, per ton of 2000 lb., for coke made in beehive ovens in Cumberland County, in the State of Tennessee, shall be for blast-furnace coke $7.25, and for 72-hr. selected foundry coke $8.25.

The maximum price f.o.b. cars at ovens per ton of 2000 lb. for coke made in beehive ovens at Ansted, W. Va., shall be for blast furnace coke $7, and for 72-hr. selected foundry coke $8.

The expression "72-hr. selected foundry coke" shall include only coke selected in accordance with the usual trade practice for foundry use, and the price named for 72-hr. selected foundry coke shall in no case be charged for any shipments to blast furnaces for smelting iron or other metal.

The Fuel Administration is watching coke operators closely, and is strictly enforcing both regulations and prices. Charges were recently brought against James H. Hoover of McClellandtown, Pa., for failing to make shipments of coke from his plant, as directed by the United States Fuel Administrator. It was also charged that he neglected and refused to make reports to the United States Fuel Administration as directed by such order.

Appearing by counsel before the Fuel Administrator, Mr. Hoover admitted the justice of the charges, and promised that he would "in future abide by and carry out to the letter" all the orders of the United States Fuel Administration now in force or that might hereafter be made. He especially requested the United States Fuel Administration to determine and fix what in its judgment was a fair and reasonable penalty for his violation of the rule, and he was thereupon ordered to donate the sum of $2,500 to the American Red Cross.

The United States Fuel Administration has made public a regulation prohibiting coal distributors and dealers from adding to the price they charge for coal any increased freight rate which they have not actually paid or become obligated to pay. This action has been taken in anticipation of efforts on the part of certain dealers to make an illegitimate profit based on the increase in freight rates on coal, which became effective June 25. On that date large stocks of coal were in the hands of dealers, who paid the former freight rates. They will not be allowed to increase their selling prices on this coal by adding the increase in the rate. This regulation will also apply to coal shipped to the various pools at tidewater, where large quantities are accumulated to await shipping facilities. The advanced rate may only be charged on coal entering pools when the railroads have actually transported the coal under the new rate.

A Chester Steel Foundry Adds an Open-Hearth Furnace

The Atlantic Steel Castings Co., Chester, Pa., has recently completed the installation of a new 6-ton acid open-hearth furnace for the production of special light castings of nickel steel. The company is engaged on Government work.

On Monday, July 1, a large fly wheel in the Vandergrift, Pa., works of the American Sheet & Tin Plate Co., burst, doing considerable damage to the plant, but fortunately only five out of nearly 1500 employees in the mill when the accident occurred were injured, and these only slightly. The plant will be crippled in its operations for some time.

RATE HEARING OPENS

Important Investigation at Bridgeport May Have Far-Reaching Effect

A section of the National War Labor Board began in Bridgeport, Conn., July 1, a series of hearings for the adjustment of wage rates in the metal working industries of that city. The section that is to sit through the hearings includes Frederick N. Judson, who was selected by Chairman William H. Taft to serve as his alternate, Chairman Frank P. Walsh, Loyall A. Osborne and William N. Johnson. Mr. Taft presided at the opening of the hearing, but withdrew in the middle of the session.

Most of the afternoon session was consumed by a statement of the employees' side of the controversy made by Fred Hewitt, an officer of the International Association of Machinists. This statement was a carefully prepared rehearsal of the history of the labor troubles in Bridgeport with full references to the successive steps in the agitation for increased wage rates which began in August, 1917, and culminated in the serious strike of last week, which affected about half of the factories in the city. In his opening statement, the speaker announced that charges of discrimination against union workers and of intimidation by army officers and manufacturers would be presented. It is expected that at least three full days will be needed to complete the presentation of the outlines of the testimony to be offered by the employers and employees. It is believed that the hearings will last at least two full weeks and that a recess of several days will be declared after the initial testimony is in so that statistics of prevailing rates of wages and local living costs may be compiled for the information of the board.

Agreement of Employers

This development is expected because at the outset of the hearing the Manufacturers' Association of Bridgeport asked that the board consider the rate question not only for the machinists and toolmakers concerned in the original controversy—a group of workers comprising not more than 10 per cent of the employees in the factories involved in the controversy—but also the rates for all the employees in the production departments of all the metal working plants in the city. The employers stated that they believed that a settlement affecting less than 10 per cent of the employees would not allay the unrest; it would only serve to increase it. To make a full consideration of the wage rates possible, the manufacturers announced that they would later file with the board an agreement signed by virtually every employer of metal workers in the city to abide by the decision of the section of the board sitting upon the case. The chairman announced that by vote of the full board the section of the board sitting upon the case was empowered to broaden the scope of the hearing as desired by the employers. The spokesman for the machinists also announced that the union members would abide by the decision of the section of the full board hearing the case. These announcements assure that there will be no appeal to the full board after the decision of the section hearing the case is handed down.

Manufacturers from all parts of New England are attending the hearings and the decision of the board will be awaited with interest by employers of machinists throughout the country for it is felt that the decision to be made in Bridgeport will in reality set up the standards and set forth the principles by which wage adjustments are to be determined in the machine shops of the whole nation.

Strike Soon Ended

The setting aside of the so-called Rogers award by the Secretary of War, June 24, as told in last week's issue of THE IRON AGE was followed immediately by a strike in the factories engaged in the production of munitions in spite of repeated telegrams from the Secretary of War urging the men to remain at work and stating that the War Labor Board would give a prompt hearing upon the matters in dispute. After the leaders of the strikers had visited Washington and consulted with the War Labor Board and after the manufacturers then involved in the controversy had agreed to abide by the decision of the board, the men, at a largely attended meeting June 28, voted to return to work at once and, with one small outbreak since, production in the shops is again in full swing.

Federal Labor Cases at Iron and Steel Plants

WASHINGTON, July 2.—The National War Labor Board makes the following announcements relative to action taken on cases now pending before it:

"B. L. Worden and Thomas J. Savage have been assigned to the controversy between the Midvale Steel Co. and its employees at Philadelphia. Three thousand men recently were on strike at this plant. They finally returned to work on June 27 following telegraphic advices from the National War Labor Board that it would take up their case when they had returned to their places. An examiner has also been assigned to investigate this case. Alva C. Dinkey, president of the company, has indicated that he does not consider it necessary to submit to the War Labor Board for the reason that he did not recognize his men to be on strike.

"It was decided that whatever shall be the award made by Messrs. Taft and Walsh in the controversy between the Sloss-Sheffield Steel & Iron Co. and its employees at Russellville, Ala., shall also be applied in the case of the Suwanee Iron Co. which operates in the same locality. This action was taken at the request of the Suwanee company which feared further labor trouble if conditions in their plant did not conform to those in the vicinity.

"C. E. Michael and William H. Johnston were assigned as a section to adjust the controversy between the Wheeling Mold & Foundry Co. and its employees at Wheeling, W. Va. In this case also the men were on strike and returned to work when the employers agreed to submit the dispute to the National War Labor Board for arbitration.

"The controversy between the Minneapolis Steel & Machinery Co. and the machinists in its employ has been decided to be a matter that required the attention of the entire board, inasmuch as it involves the proclamation to govern industrial relations in Minnesota recently promulgated by Governor Burnquist of that State. It is contended by critics of that proclamation that it does not conform to the policies and principles of the National War Labor Board approved by the President as a basis upon which industrial disputes shall be settled during the war.

"It has been decided that the entire membership of the board should also hear the facts in the controversy between the Stove Mounters' International Union Local No. 8 and the Estate Stove Co. of Hamilton, Ohio, which has been submitted to the board through an agreement with the War Department for arbitration.

"John F. Perkins and William H. Johnston have been assigned as a section to adjust the controversy between the Mason Machine Works and its employees at Taunton, Mass. Both sides joined in submitting this case to the board.

"Herbert H. Rice and T. A. Rickert were assigned as a section in the foundry cases in Detroit.

"An examiner has also been assigned to inquire into the facts of the controversy between the Hamilton Machine Tool Co. and its machinists at Hamilton."

Fabricating Plant in South

BIRMINGHAM, ALA., July 2—Through Harry Leon Brittain, New York, and, it is understood, under auspices of the United States Shipping Board, a deal has been closed at Birmingham for 52 acres on which to erect a plant for fabricating ship and other steel shapes. The same interests are operating shipbuilding plants at Jacksonville, Savannah and other points. Immediate construction of a large unit is promised, steel plates to be secured from the Bessemer mill of the Tennessee Coal, Iron & R. R. Co., the Fairfield mills under construction and other points. Favorable distributing freight rates have been obtained.

Machinery Markets and News of the Works

CRANES UNDER CONTROL

Government May Supervise All Selling

Letting of Orders by Bethlehem Shipbuilding Corporation Held Up on this Account

Government control of the manufacture and sale of traveling cranes has been decided upon, according to information given last week to representatives of crane builders in New York. The Bethlehem Shipbuilding Corporation, Bethlehem, Pa., was about to let orders for about 100 traveling, hammerhead and tower whirley cranes when instructions were received from Washington to submit the proposition to the War Industries Board before going ahead. It is expected that Government control will take the form of that exercised over locomotive cranes, a committee in Washington having general supervision of all orders, prices and priority.

The Bethlehem Shipbuilding Corporation has placed large orders for fabricating machinery, machine tools, etc., for its new Liberty plant at Alameda, Cal. It has also issued a list of about 50 machines for its Sparrows Point (Md.) shipyard, where extensions are in progress.

Inquiry for cranes and hoists has continued a feature of the machinery market. One of the large inquiries is from the Cambria Steel Co., Johnstown, Pa., which requires 94 2-ton hoists.

Westinghouse Church Kerr & Co. have bought another lot of cranes for a Baltimore & Ohio Railroad locomotive shop to be built at Cumberland, Md. Machine tools and fabricating machines will also be needed.

The Pennsylvania Railroad Co. is inquiring in Philadelphia for complete equipment for a new locomotive shop at Marietta, Pa.

Two companies in the Philadelphia district may engage in the manufacture of 8-in. semi-steel shells. Tentative inquiries for machine tools have been issued. The New York Shipbuilding Corporation, Camden, N. J., has placed large orders with Philadelphia dealers. The Navy Department has inquired in that city for 58 lathes, 12 to 18 in. The Midvale Steel & Ordnance Co., Philadelphia, has not placed orders as yet for equipping its new gun plant.

Machine-tool demand in New York is spotty. New England shows fair activity. The Navy Department at Charlestown, Mass., is in the market for a list of tools. The American Shell Co., Paterson, N. J., has bought equipment for expending its production of 75 mm. shells.

In Chicago the trade is somewhat quieter, though a few good-sized deals have been consummated. The Otis Elevator Co. has bought for its Chicago plant, where it is making recoil mechanisms. The Four Lakes Ordnance Co., Madison, Wis., is inquiring for tools to increase production of guns. The Kokomo Steel & Wire Co., Kokomo, Ind., has received a shell contract and will expend about $3,000,000 for new buildings and equipment. The Western Cartridge Co., East Alton, Ill., is making plans to triple its production. The Symington-Anderson Co., Rochester, N. Y., has purchased a site in Chicago for its new shell plant.

The Pittsburgh trade has been doing a very satisfactory business with several companies which have large contracts for fabricating ship plates. Punches, shears and drills have been in good demand. A list of machine tools has been issued for a shop to be built in connection with a steel plant in the Shenango Valley.

The New York Central Railroad is placing orders in Cleveland against its recent list of 175 tools.

New York

NEW YORK, July 2.

The Bethlehem Shipbuilding Corporation, Bethlehem, Pa., was about to place orders last week for cranes for its new Liberty shipyard at Alameda, Cal., when word was received from Washington not to buy standard bridge cranes, because this manufacturing industry was to be placed under Government control. Local crane sellers interpreted this to mean that the manufacture of traveling cranes would be placed under the same sort of supervision as that which has been exercised in the locomotive crane industry for some months. A committee in Washington will probably have charge of distribution of orders.

Until about two months ago, many of the crane builders were hungry for orders. Then came an avalanche of inquiries, with the result that Government authorities awoke to the fact that the crane shops might become filled with orders for six or eight months ahead, thus complicating the situation when it became of urgent necessity for the Government to obtain cranes for its own projects. Priority certificates will now undoubtedly be required on all orders, and none but the most essential business will be taken.

While there are not as many inquiries as a few weeks ago, crane builders are being kept very busy making quotations. Several large orders have been placed within the past week, including nine cranes for the Cumberland, Md., locomotive shop to be built for the Baltimore & Ohio Railroad, bought by Westinghouse Church Kerr & Co., New York, the engineers. Two 100-ton cranes were ordered from the Morgan Engineering Co., Alliance, Ohio, and a 30-ton, a 15-ton bridge crane and a 15-ton single-leg gantry and four 3-ton wall cranes from the Toledo Bridge & Crane Co., Toledo, Ohio. The Federal Shipbuilding Co., New York, ordered four 10-ton cranes from the Milwaukee Electric Crane & Mfg. Co., Milwaukee, Wis., and issued a list for five more cranes for its plate shop as follows: Two 20-ton, double trolley, 71-ft. 3½-in. span; one 10-ton, double trolley, 48-ft. 8-in. span; two 10-ton, double trolley, 60-ft. span. The Downey Shipbuilding Corporation, New York, which recently inquired for a 35-ton crane, is now also in the market for a 10-ton crane.

The Cambria Steel Co., Johnstown, Pa., is in the market for 94 2-ton hoists. The Atlas Crucible Steel Co., Dunkirk, N. Y., has bought a 25-ton crane from the Cleveland Crane & Engineering Co., Wickliffe, Ohio. The Savage Arms Corporation, Sharon, Pa., has bought two 10-ton and two 5-ton cranes from the same company. The Worthington Pump & Machinery Corporation, New York, wants a 15-ton crane, 46-ft. span, for its Deane Pump Works, Holyoke, Mass. The Air Nitrates Corporation, 360 Madison Avenue, New York, requires eight locomotive cranes for two new nitrate plants which will be built at Toledo and Elizabethtown, Ohio.

Machine-tool trade in New York continues spotty, some companies reporting a good demand, while others are doing a small business, compared with recent records. New Eng-

land shows more activity than for many weeks. The Navy Yard at Charlestown, Mass., is in the market for considerable equipment for a new shop. The Watertown Arsenal, Watertown, Mass., has placed orders for tools for its gun-carriage shop. The Reed-Prentice Co., Worcester, Mass., has bought a small list of new tools.

The American Shell Co., Paterson, N. J., has bought tools for an addition to its plant, the company's contract for 75-mm. shells having been increased. The Thompson & Starrett Co., New York, is buying tools for a powder plant it is building for the Government. The Vulcan Iron Works, Jersey City, N. J., has issued a list of 12 machines for a boiler shop.

The Virginian Railway is buying a few tools. The Pennsylvania Railroad System has inquired for tools for a new locomotive shop at Marietta, Pa. Westinghouse Church Kerr & Co., New York, will build a new locomotive shop at Cumberland, Md., for the Baltimore & Ohio Railroad, which will be almost a duplicate of the new shop at Glenwood, Pa. This engineering concern will buy the tool equipment for both shops from its New York office.

The Navy Department, Washington, has arranged for the occupancy of four of the buildings, Nos. 3, 4, 5 and 6, at the Bush Terminal, Second to Third Avenue, Brooklyn, each about 75 x 330 ft., to be used for assembling work. Possession will be taken about Dec. 1.

In connection with the five-story reinforced-concrete automobile garage, 200 x 350 ft., to be erected by the Inter-State Garages, Inc., New York, on Second Avenue from Forty-seventh to Forty-eighth streets, a general machine and repair shop, 160 x 200 ft., will be provided.

The North & South Construction Co., Albany, N. Y., has been incorporated with a capital of $100,000 to operate a boat-building works. H. S. Patton, Whitesboro; F. A. McNamee, and M. McC. Harris, Main Avenue, are the incorporators.

The Bureau of Yards and Docks, Navy Department, Washington, has prepared plans for the installation of new boiler works at the naval works on Wards Island, N. Y., to cost $40,000.

The Doehler Die Casting Co., Ninth and Huntington streets, Brooklyn, has awarded contract to the Turner Construction Co., 244 Madison Avenue, New York, for a seven-story reinforced-concrete addition, 90 x 105 ft., to cost $175,000.

The Multiplex Tool Co., Brooklyn, has been incorporated with a capital of $100,000 by O. Nygren, G. S. Joberg and E. Anderson, 373 West 123rd Street, New York, to manufacture tools.

The Whyte Leverage Spring Corporation, New York, has been incorporated with a capital of $50,000 by G. W. Bachman, E. Menzel and W. J. Vreeland, 129 Front Street.

The Oldham New York Saw Works, 112 Twenty-sixth Street, Brooklyn, has increased its capital from $10,000 to $200,000.

The Studebaker Corporation, 1751 Broadway, New York, has leased its four-story plant, on Anable Avenue near Meadow Street, Long Island City, to the National Casket Co., Jackson Avenue, Long Island City, which will use it for a new works to replace its own, acquired by the Government for the manufacture of gas masks. The plant provides for a manufacturing area of 70,000 sq. ft. The Studebaker Corporation has acquired property at Fiftieth Street and Eighth Avenue, New York, and will remove its former works to the new location.

The Robert C. Emmons Co., Brooklyn, has been incorporated with a capital of $10,000 by D. G. Horter, and S. and R. C. Emmons, 9404 Third Avenue, to operate a shipbuilding works.

The Chadburn Ship Telegraph Co. of America, Inc., New York, has been incorporated with a capital of $50,000 by W. P. Allen, J. L. Galey, 39 West Twenty-seventh Street, and F. A. Whitney, 501 West 121st Street, to manufacture electrical specialties.

The American Can Co., 120 Broadway, New York, has leased for a term of years the plant at Anable Avenue and Creek Street, Long Island City, formerly held by the Kindel Bed Co., Chicago. It is 200x250 ft., providing a floor area of 80,000 sq. ft.

The Eberhard Faber Pencil Co., 200 Fifth Avenue, New York, with factory at 39 Greenpoint Avenue, Brooklyn, has increased its capital from $1,000,000 to $1,500,000.

The J. M. Can Opener Co., New York, has been incorporated with a capital of $30,000 by E. D. Henderson, F. H. Tiedeman, and H. L. Klein, 375 Manhattan Avenue.

The Derf Mfg. Co., New York, has been incorporated with a capital of $100,000 by F. L. Hartt, W. B. Noble, and W. F. Wilson, 28 West 130th Street, to manufacture engines, motors, etc.

The Bureau of Yards and Docks, Navy Department, Washington, has received bids for a new naval air station with auxiliary shop structures at Rockaway, L. I., at an estimated cost of $175,000.

Rich & McLean, 73 Beekman Street, New York, machinery dealers, have increased their capital from $10,000 to $75,000.

The New Home Sewing Machine Co., 45 East Seventeenth Street, New York, is considering plans for the construction of additions to its plant at Orange, Mass., to cost over $150,000. Francisco & Jacobus, 511 Fifth Avenue, New York, are the engineers. Work has been commenced on a $75,000 addition.

The C. H. Mfg. Corporation, New York, has been incorporated with a capital of $50,000 by W. K. Bach, C. L. Kay and I. W. Bach, 560 West 148th Street, to manufacture galvanized metal products.

The Crescentini Air Ship Corporation, New York, has been incorporated with a capital of $100,000 by G. Doyle, F. C. Haven, and L. Crescentini, 149 Broadway.

S. Smith & Sons, Cold Springs, N. Y., have been incorporated with a capital of $25,000 to manufacture vehicles, automobile parts, etc. H. M. Brigham, J. H. Rose, New York; and M. O. Heck, 29 Orient Avenue, Brooklyn, are the incorporators.

The Oriskany Malleable Iron Co., Oriskany, N. Y., has been incorporated with a capital of $82,000 by C. H. Monnier, E. Welsh, and G. G. Baer.

The General Electric Co., Schenectady, N. Y., is completing the construction of a one-story steel foundry, 60 x 235 ft., and a one-story drop forge building, 100 x 200 ft., to cost in all $100,000.

The Begley Auto Signal Co., Inwood, N. Y., has been incorporated with a capital of $20,000 by T. E. Pettit, W. J. Begley, and M. P. McNamara, Far Rockaway.

The New Jersey Roofing Co., 313 New Brunswick Avenue, Perth Amboy, N. J., will build two additions, 41 x 50 ft., and 42 x 50 ft.

The Curtiss Flying Machine Co., Atlantic City, N. J., subsidiary of the Curtiss Aeroplane & Motor Corporation, Buffalo, will establish a works for the production of aircraft parts on the Inlet. It will give employment to about 100 men for initial operations. The company has received a contract from the Navy Department for seaplane parts. Earl Ovington, president and general manager, has recently incorporated the Ovington Aeroplane Co. under Delaware laws with a capital of $600,000 to manufacture aircraft. H. W. Gell and R. E. Steele, both of Atlantic City, are also interested in the latter organization.

The Bethlehem Loading Co., Mays Landing, N. J., a subsidiary of the Bethlehem Steel Co., Bethlehem, Pa., is planning the construction of a boiler plant. The works will specialize in the loading of 75 and 165 mm. shells.

The Riverside Metal Co., Riverside, N. J., manufacturer of castings and sheet-metal products, has increased its capital from $500,000 to $1,500,000.

The Progressive Machine & Tool Co., Jersey City, N. J., manufacturer of tools, etc., has acquired the factory of the Coats Machine Co., 280-82 Sip Avenue, Jersey City, for a new works.

The Morgan Engineering Co., 120 Broadway, New York, is negotiating with the City Commission, Jersey City, N. J., for the construction of a dry-dock at the foot of Morgan Street. The proposed works would comprise a machine shop, etc. Thomas P. Connelly is president.

The Dual Welding Apparatus Co., Elizabeth, N. J., has been incorporated with a capital of $50,000 by M. Lucas, Frederick DeMeese, and Robert Zuber, Elizabeth, to manufacture welding equipment.

A boiler plant to cost $37,500 will be erected by the General Electric Co., Harrison, N. J., on Cross Street. Plans have been filed.

The Industrial Wire & Metal Works, Newark, N. J., has filed notice of organization to operate a works at 95 High Street for the manufacture of wire guards. Richard Carswell, 277 Lake Street, heads the company.

The Essex Foundry, Avenue D and Murray Street, Newark, manufacturer of cast-iron pipe, has filed plans for a one-story brick and steel foundry to cost $25,000.

The Day Elder Motors Corporation, 161 Ogden Street, Newark, has awarded a contract to the Becker Construction Co., 361 Grove Street, for a plant at Coit Street and Clinton Avenue, Irvington, for the manufacture of automobile trucks.

The M. V. Weather Train Controller Co., Newark, has acquired a factory at Summer Avenue and Crane Street for the manufacture of its specialties.

Buffalo

BUFFALO, July 1.

The Howard Iron Works, Buffalo, is building a one-story brick addition to its machine shop to cost $6,000.

The King Iron Works, Buffalo, is making alterations and additions to its foundry at Ohio and Chicago Streets.

The Strong Steel Foundry Co., Buffalo, is taking bids for an additional foundry, 50 x 300 ft., at its plant on Hertel Avenue, Norris Street and the Erie Railroad. O. H. P. Champlin is president.

The Wood Products Co., Buffalo, manufacturer of wood alcohol, has filed plans for a brick boiler house at its plant Fourth Street, Erie Canal and the New York Central Railroad.

The General Electric Co. is to establish a branch plant at Buffalo for the manufacture of incandescent electric lamps, and has filed plans for a three-story brick and steel factory, 80 x 295 ft., at Fillmore Avenue and East Ferry Street.

It is stated the cost will be $250,000 and the output 90,000 lamps per day. About 700 men and women will be employed.

The Buffalo Dry Dock Co., Buffalo, operating a shipbuilding works on Ganson Street, has had plans prepared for a one-story machine shop to cost $9,000.

The Buffalo Structural Steel Co., Dart Street, Buffalo, is considering building an addition on property north of the railroad tracks at its present works. In this connection it has been granted permission by the city council to erect a crane runway and overhead crane across Dart Street.

The Barcalo Mfg. Co., 225 Louisiana Street, Buffalo, manufacturer of iron and brass beds, will build a one-story extension, to cost $6,000.

The Cousins & Son Boiler Works, Wabash Street, Buffalo, has filed plans for a one-story boiler house and shop, 85 x 120 ft., on Tifft Street.

New England

BOSTON, July 1.

The even flow of business to the machine-tool trade continues unchanged. A few manufacturers report that they are gaining a little on deliveries and on some kinds of small machine tools deliveries are now quite prompt. On the larger tools the builders are steadily going behind, and there is a widespread expectation that some of the manufacturers who ordinarily do not build heavy machinery will be asked to change the character of their present production so that they can help out on the demand for heavy machine tools. Just how this will be done is not now clear, but a delegation of representative machine-tool builders is to visit Washington this week to obtain further light upon the situation.

The threat of continued labor troubles grows less. The strikers in several Bridgeport factories have returned to work, both sides to the wage controversy having agreed to abide by the decision of the Taft-Walsh board, which is to begin its hearings on the matter July 1 at Bridgeport. Transportation slowness continues to hamper industry, but some betterment is apparent.

The Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., will build a storage building, 30 x 82 ft., one story, and has awarded to the Ellison Construction Co. a contract to erect a factory addition, 25 x 46 ft.

The Traut & Hine Mfg. Co., New Britain, Conn., has awarded a contract to William H. Allen, New Haven, to build two additions: 43 x 93 ft., three stories, and 46 x 96 ft., one story.

The Waterbury Fastener Co., Waterbury, Conn., has increased its capital stock from $5,000 to $50,000.

The Yale & Towne Mfg. Co., Stamford, Conn., has awarded a contract to S. E. Elliott for a small addition.

The James Hunter Machine Co., North Adams, Mass., has awarded to J. R. Button & Son a contract for a machine shop addition, 75 x 75 ft., one story.

The Fafnir Bearing Co., New Britain, Conn., has awarded a contract to the James H. Grozier Co., Hartford, to make extensive alterations to its plant at a cost of about $5,000.

The Chelsea Foundry Co., Chelsea, Mass., has had plans drawn for an addition, 60 x 125 ft.

The New Haven Boiler Works, New Haven, Conn., has awarded a contract to Maher & O'Connell for an addition, 26 x 30 ft., one story.

The Coast Ship Engineering Corporation, Boston, contemplates the building of a 5-way ship plant at Fall River, Mass. Edmund C. Eastman, 85 Devonshire Street, Boston, is president, and Carl H. Clark, 85 Water Street, Boston, engineer.

Philadelphia

PHILADELPHIA, July 1.

The Philadelphia machine-tool market shows considerable activity, the demand for tools for shipyards being particularly large. The Bethlehem Shipbuilding Corporation, Bethlehem, Pa., has placed orders for machines for a plate and angle shop at its new Liberty shipyard at Alameda, Cal., this business being divided among Hilles & Jones, the Cleveland Punch & Shear Works Co. and the Long & Allstatter Co. Orders for tools for the machine shops are also being placed. In addition, the Bethlehem Shipbuilding Corporation has issued a list of about 50 large tools for its Sparrows Point, Md., plant.

The Pennsylvania Railroad System will buy a large number of tools, cranes, etc., from its purchasing department in Philadelphia for a new locomotive shop at Marietta, Pa. The Baltimore & Ohio Railroad will soon be in the market for equipment for a new locomotive shop at Cumberland, Md., the contract for cranes having already been placed.

The Midvale Steel & Ordnance Co., Philadelphia, has not closed as yet for the cranes and machine tools required for its new Nicetown gun plant, but orders will probably be given soon. Another large list pending is that of the American Steel & Forge Corporation, Widener Building, Philadelphia, which may build a plant near this city for the manufacture of crankshafts for ships. The Emergency Fleet Corporation has definitely abandoned the projected enlargement of the plant of the Westinghouse Electric & Mfg. Co., Lester, Pa., which is building ship-propelling machinery. Nothing has yet been done with regard to the new plant for reciprocating engines which the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., was to build at Richmond, Va.

The New York Shipbuilding Corporation, Camden, N. J., has been one of the largest buyers in this market in the past few weeks. Its purchases have run very heavy, and are not yet completed.

As a result of successful tests of 8-in. semi-steel shells, specifications for which were published in THE IRON AGE last week, two large companies in this district may equip shops for machining them. One company has received quotations on a tentative list of about 140 tools.

The Navy Department is inquiring for 58 lathes, from 12 to 18 in., for an ordnance plant.

The American Galvanizing Co., Grays Ferry Road, Philadelphia, is planning the remodeling of its three-story plant at Twenty-fifth Street and Morris Avenue.

The Gosa Brockman Co., 12 North Fifth Street, Philadelphia, manufacturer of tools, has awarded a contract to F. L. Hoover & Son, Inc., 1023 Cherry Street, for a one-story machine shop, 60 x 62 ft., to cost $13,000.

Burton C. Simon, Nineteenth Street, Philadelphia, has awarded contract to H. F. Dinkelacker, 227 North Farson Street, for a one-story addition to his machine shop, 64 x 135 ft., at Twenty-third Street and Passyunk Avenue, to cost $20,000.

The Philadelphia Railways Co., Land Title Building, Philadelphia, is building a new one-story shop, 60 x 200 ft., at Penrose and Ferry streets to cost $30,000.

The Bennington Foundry & Machine Co., Philadelphia, has been incorporated with a capital of $100,000 by Wray C. Arnold and R. E. Meredith.

The Edgar T. Ward's Sons Co., Sixteenth Street and Indiana Avenue, Philadelphia, iron and steel merchant, has acquired a two and three-story concrete building, on Sixteenth Street, on land 105 x 270 ft., near Indiana Avenue, at a cost of $206,898.

A metal-working shop and other mechanical departments will be erected in connection with the occupational school to be established by the School of Occupational Therapy, Philadelphia. Major Tait McKennie and Dean Graves, Philadelphia, are interested in the school. Mrs. H. Gordon McCouch is chairman of the committee.

The H. W. Hoyer Machine Co., Philadelphia, has been incorporated with a capital of $25,000 to manufacture machinery. Harvey W. Hoyer, William G. Underwood and Robert M. Hause are the incorporators.

The Delaware Engineering Co., Philadelphia, has been incorporated with a capital of $400,000 to manufacture machine tools, hand tools, dies, etc. Wyle T. Wilson, Charles F. Bochman, Philadelphia, and William R. Davidson, Wilmington, Del., are the incorporators.

The Eddystone Munitions Co., Philadelphia, operated by the Baldwin Locomotive Works, is said to be planning to increase its capital from $100,000 to $2,000,000 to provide in part for proposed expansion at its works at Eddystone.

The War Department, Washington, has taken over the plant of the Ancona Printing Co., Gloucester City, N. J., and will use the works for the production of munitions.

The Textile Machine Works, Reading, Pa., is now devoting its plant to the manufacture of airplane parts for the Government.

The H. Sofransey Co., Brick and Liberty Streets, Allentown, Pa., maker of iron and steel goods, will build a two-story addition 40 x 185 ft., at a reported cost of $40,000.

Baltimore

BALTIMORE, July 1, 1918.

The Ellicott Machine Corporation, Bush and Severn streets, Baltimore, Md., will build an addition at Bayard and Wicomico streets, 50 x 125 ft.

The American Locomotive Works plans the construction of a pattern shop building at its Richmond, Va., plant.

Announcement has been made that the Maryland Steel Co., Sparrows Point, Md., a subsidiary of the Bethlehem Steel Co., has awarded a contract for three additional shipways to the Aberthaw Construction Co. This is a part of the program of extension announced several months ago. The additional ways will bring the total to nine.

Charles Elliott, Baltimore, has filed plans for a one-story machine shop, 50 x 120 ft., at Bayard and Severn streets.

The Edgewood Arsenal, Magnolia, Md., will build 10 new buildings, each about 100 x 200 ft., for munition manufacture, at a cost of $200,000. Captain Hall is in charge.

Fire, June 22, destroyed a portion of the works of the Delaware Marine Mfg. Co., Concord Avenue, Wilmington, Del., with a reported loss of about $100,000. The plant has been engaged in the manufacture of brass portholes for torpedo-boat destroyers, and other similar specialties under contracts with the Government.

A new boiler plant will be erected by the Baltimore Shipbuilding & Dry Dock Co., Baltimore, on Fort Avenue.

The American Electric Tool Co., Petersburg, Va., operating a works for the manufacture of electric calking tools, etc., is planning an addition.

The Water Gas Production & Combustion Co., Atlanta, Ga., has been incorporated with a capital of $500,000 to manufacture water gas-producing machinery and combustion equipment. L. C. Kalb, J. R. Ryan and J. J. Finnegan are the incorporators.

The Mays Mfg. Co., Lexington, N. C., has been incorporated with a capital of $2,500,000 to manufacture adding machines and other specialties. Adam L. Link, Walter W. and Baxter Shemwell are the incorporators.

Pittsburgh

PITTSBURGH, July 1.

For the past two weeks or more the greater part of the activity in this locality has been the heavy demand for machine tools for fabricating ship plates. Recently the McClintic-Marshall Co., the Pittsburgh-Des Moines Co., the Pressed Steel Car Co., the Standard Steel Car Co., and other local manufacturers have received very heavy Government orders for this kind of work, the McClintic-Marshall Co. having received larger orders than any other concern. All of them have been buying more or less heavily of drills, punches and shears for this purpose, one local machine-tool company having taken orders recently for over $100,000 worth of tools. The McClintic-Marshall Co. has placed orders with Williams, White & Co., Moline, Ill., and has also bought very heavily of punches, shears, multiple punches and other tools. The Pressed Steel Car Co. has bought 12 or 15 punches besides other metal-working equipment. As yet no definite list of machine-tool requirements and other equipment for the Neville Island plant, to be built by the ordnance department of the United States Steel Corporation, has come out. There has been a general inquiry for tools sent out for a large machine shop to be built in connection with a proposed steel plant to be erected in the Shenango Valley, but no details of this are yet obtainable.

Active work has started on the new car shop of the Baltimore & Ohio Railroad at Glenwood, near Pittsburgh, being built by Westinghouse, Church, Kerr & Co. The list of tools needed for these new shops is expected to come out in a short time. The engine house and car shops of the railroad are to be removed from New Castle, Pa., to Youngstown, Ohio. Work will start very soon, and it is likely some new equipment for the shops will be needed, as they are to be considerably enlarged.

The United Engineering & Foundry Co. Lloyd Booth Department, Youngstown, Ohio, is inquiring for a precision horizontal boring mill and a used 38-in. x 27-ft. heavy-duty engine lathe, also for two used 20-ton cranes.

The Pennsylvania Furnace & Stove Co., Warren, Pa., is in the market for a No. 97 Toledo squaring shear, 8 or 10-ft. power rolls for ¼-in. plate, 18-in. throat, for a power punch, and an 8 to 10-ft. power press.

The Pennsylvania Lines West will make additions and install new equipment at its shops at Denniston, Ohio, to cost $2,000,000 to $3,000,000. These will include a new freight yard, and enlargement of the roundhouse and shops. It is likely that much new equipment will be needed for the extensions.

The Aetna Chemical Co., Pittsburgh, will build a plant at Mount Union, Pa., for the manufacture of high explosives.

The Standard Sanitary Mfg. Co., Pittsburgh, Pa., is removing its brass department to Louisville, Ky., to be consolidated with its brass foundry there.

The Federal Electric & Mfg. Co., McKees Rocks, Pa., has been incorporated with a capital of $50,000 by Miles Bryant and associates to manufacture electrical goods.

Bard, Blankenmyer, Inc., Lancaster, Pa., has been incorporated with a nominal capital of $5,000 to manufacture metal goods. Charles K. Will is the principal incorporator.

Bovaird & Seyfang, Bradford, Pa., manufacturers of oil well supplies, etc., will build a new foundry, 90 x 100 ft., to cost $90,000. The Pittsburgh Bridge & Iron Co., Pittsburgh, has the contract for erection.

The Kelly & Jones Co., Greensburg, Pa., manufacturer of valves, steam fittings, brass and bronze specialties, will build a one-story addition to its plant, 70 x 550 ft.

Chicago

CHICAGO, July 1.

Distributers of machine tools report a somewhat quieter trend in the past week, yet the aggregate of small inquiries from miscellaneous sources is of no mean proportions and a few good-sized deals have been consummated, the Otis Elevator Co., among others, having placed a good-sized order for its Chicago plant, where it is making recoil mechanisms.

It is conceded that dealers have but little prospect of being able to replenish their stocks. The tools they have on their floors are almost invariably of the kind but little used in munitions manufacture, yet these are being depleted. The builders of such tools are accepting orders for stock purposes from the dealers, but in doing so they state they cannot say when delivery will be made and it is hardly probable that any machines will be shipped from the factories unless it is on priority orders.

W. S. Symington, Jr., of Baltimore, representing the Symington-Anderson Co., has purchased a tract of land at Ashland Avenue and Seventy-fourth Street, Chicago, on which the company will erect a shop for the manufacture of 155-mm. shells. The construction manager of the company has been in Chicago and it is expected that building will begin at once. It is now well understood that practically all of the production machinery used by the company will be of special design and, as heretofore stated, be made in the East. It is reported that the toolroom equipment will be purchased in Chicago. When the plant is completed it probably will employ 5000 men.

Railroad business of large proportions is looming up since the roads were authorized to expend large sums for repairs and improvements. The trade here has a large list issued by the New York Central against which orders will be placed at Cleveland. The general contract has been awarded by the Illinois Central Railway Co. for a number of buildings, including a machine shop, roundhouse and power house at Carbondale, Ill., to cost $150,000. The Chicago, Milwaukee & St. Paul will construct at once a 10-stall roundhouse at Calmar, Iowa, while expenditures at Ottumwa, Iowa, will total $500,000. At Webster, Iowa, the Illinois Central Railway Co. will erect a one-story machine shop and power house at a cost of $75,000.

The Four Lakes Ordnance Co., Madison, Wis., which is allied with the Steinle turret lathe interests, is inquiring for tools with which to increase its production.

Several firms in Illinois are figuring on the production of 75-mm. shells, but it is not yet apparent that contracts have actually been placed.

It is reported that the Kokomo Steel & Wire Co., Kokomo, Ind., has been notified that it will be awarded a contract for the manufacture of shells. It is the company's plan to utilize the steel from its own mill. It contemplates the expenditure of over $2,000,000 for buildings and equipment, the plant to be built on ground which the company owns adjoining its billet mill.

The Connolly Iron Sponge & Governor Co., Chicago, has purchased a tract on the Sanitary Canal near California Avenue, and will erect a building to cost about $25,000. The present address of the company is Twenty-second and Morgan streets.

The Simonds Mfg. Co., has placed a contract for an additional three-story factory, 50 x 130 ft., on its property at 1618 South Western Avenue, Chicago, to cost $50,000.

Plans are under way, at the request of the United States Government, by which the Western Cartridge Co., East Alton, Ill., will triple its production. It is considered not improbable that the company will build in St. Louis should labor and housing conditions make this advisable.

Director-General McAdoo has approved an appropriation of $500,000 for the construction of locomotive shops at Tipton, Ind., for the Lake Erie & Western Railroad, to replace those recently burned at Lima, Ohio.

The Steel & Tube Co. of America, a Delaware corporation, has obtained a permit to do business in Indiana where $5,000,000 of its capital stock is represented. Robert W. McBride, attorney, Indianapolis, is agent.

Milwaukee

MILWAUKEE, July 1, 1918.

The prospective placement of large-lot orders for machine-tools by the Government has not yet materialized, so far as Milwaukee tool builders are concerned. The total of bookings of machine-tool orders in June nevertheless exceeded that of the same month a year ago, when the metal-working industries started a buying movement following the declaration of war. Production is being maintained at the highest point yet reached by the machine-tool industry of this district, although apprehension is expressed over the labor situation. Steps are now being taken to provide at least partial relief by virtually conscripting idlers through a proposed State law.

The organization of Milwaukee and Wisconsin industries under the regional system adopted by the resource and conversion division of the War Industries Board has been perfected by August H. Vogel, Milwaukee, director of Regional District No. 17, and each of the 19 sections embraced by the Wisconsin district has selected chairmen and secretaries who now are actively engaged in the prosecution of the work, which already is showing tangible results.

The Gerlinger Steel Casting Co., Milwaukee, with works at Fifty-ninth and National avenues, West Allis, has undertaken extensions of its exclusive electric steel casting plant which will increase the capacity approximately 100 per cent. The building will be 80 x 171 x 200 ft., of brick, steel and reinforced concrete. The structural steel work, about 110 tons, has been awarded to the Northwestern Bridge & Iron Co., Milwaukee. The general contractor is Robert L. Reisinger, First National Bank Building. The Gerlinger company has contracted for the installation of a 3-ton Moore electric furnace, supplementing a 1½-ton and a ¾-ton Industrial Electric furnace now in service. A 5-ton electric crane will be furnished by the Pawling & Harnischfeger Co., Milwaukee. Most of the other equipment has been placed. C. A. Gerlinger is secretary and treasurer.

The Hercules Steel Casting Co., 500-501 Free Press building, Milwaukee, has awarded the general contract to the Northwestern Bridge & Iron Co., Milwaukee, for the erection of its new electric steel foundry plant on Robinson Avenue, near Becher Street, in Bay View. As already noted, the main building will be 90 x 300 ft., of brick, steel and reinforced concrete, requiring about 135 tons of structural material. The building permit gives the cost of the building alone at $40,000, and the equipment, including a 5-ton electric furnace, will bring the total cost to approximately $100,000. The shop is to be ready to pour metal Sept. 1. E. B. Gennrich is secretary and treasurer.

The Durant Mfg. Co., Milwaukee, manufacturer of counting machines and devices, will erect an addition, 35 x 85 ft., to its main shop at Hubbard Street and Reservoir Avenue at a cost of $15,000 fully equipped. Henry O. Winkler is president and treasurer.

Leicher Brothers, Loganville, Wis., have converted their garage and machine-shop into a plant for the manufacture of truck units for application to automobile chasses. Additional equipment is being purchased from time to time.

The West Bend Aluminum Co., West Bend, Wis., manufacturer of kitchen utensils and other drawn and pressed goods, expects to take occupancy of two large factory additions by Aug. 15. It is placing orders for machinery and equipment. Much of the capacity is being devoted to Government contracts for army utensils.

The Vollrath Co., manufacturer of enameled kitchen utensils, etc., Sheboygan, Wis., is erecting a brick and steel addition, 120 x 240 ft., to its enameling oven department, and a warehouse, 120 x 120 ft. The structural steel work is being executed by the Wisconsin Bridge & Iron Co., Milwaukee.

Detroit

DETROIT, July 1.

Industrial plants in Detroit and Michigan are of necessity rapidly turning to production of war materials. Many concerns which had contracts with private corporations and individuals have been attempting to fill those contracts, but their inability to get materials and transportation has forced them to turn to governmental orders without completing their contracts. From present indications it is believed that practically every industrial plant in the State able to work on war goods will be doing so within a comparatively short time.

The Government has taken a hand in the conversion of industries and through 20 regional committees in the State is conducting a survey of plant facilities to determine just what orders can be handled. Assurance has been given the State director of this work that a great number of war orders will be diverted to Detroit and the rest of Michigan, because the limit of production has been reached on the seaboard due to the scarcity there of skilled labor. A. A. Templeton, Detroit, in charge of the survey and conversion section of the War Industries Board for the State, is authority for the statement that war orders will be multiplied many times in this district.

The coal situation continues to worry manufacturers. No coal for the coming winter is being stored and large concerns working on Government contracts have declared that unless more coal is received they will be forced to shut down or curtail their output. The labor situation has temporarily improved due to the fact that industries making non-essentials have been unable to secure sufficient materials and have been forced to lay off men, who have found employment in war industries.

The Packard Motor Car Co., Detroit, has leased for three years the large buildings formerly occupied by the National Body & Trimming Co., Mount Elliott and Genesee avenues, in the rear of the Packard company's plant. Fred E. Holmes is the owner of the property, and the total rental will amount to $70,000. The buildings have 150 ft. frontage on Mount Elliott Avenue and a depth of 400 ft., with a floor space aggregating 100,000 sq. ft. The buildings in front are three stories high and the others two stories, equipped throughout with gas, electric light and sprinkler system for fire protection. The plant is located on the Michigan Central belt line. The Packard company will take possession in July and plans to utilize the plant for general manufacturing and storage purposes.

The Champion Ignition Co., Flint, Mich., will begin at once the erection of another factory unit to cost $8,000.

The Detroit-Wyandotte Motor Truck Co., Wyandotte, Mich., has sold all personal property, including machinery, material parts, equipment, etc., for $45,000. The purchasers, who bought jointly, are the New Jersey Machine Co., Newark, N. J., and S. L. Wintermitz & Co., Chicago.

The business of the Winkley Co., Detroit, manufacturer of oiling devices at 866 Warren Avenue West, has been taken over by the Bowen Products Corporation, Winkley Division. C. I. Coverton is manager.

The Studebaker Corporation, South Bend, Ind., and Detroit, has received a Government order for shells aggregating $10,000,000, and it is reported may receive another order for the same amount. Assuming that the repeat order is filled, the shell orders bring Studebaker war business up to more than $45,000,000, said to be only $5,000,000 less than its entire business last year, including both automobiles and war orders.

The Saginaw Sheet Metal Works, Saginaw, Mich., has obtained a contract from the War Department for 110,000 powder containers, amounting to $709,100. The contract calls for 60,000 small containers, 9⅛ in. in diameter and 53 in. long at a cost of $349,100, and 50,000 large containers, 11¾ in. in diameter and 67 in. long. The small containers will be used to hold powder charges for 8-in. guns and the large containers for 10-in. guns. To handle this contract substantial additions will be made to the plant and new machinery installed, while the force of employees will be enlarged.

The New Era Spring & Specialty Co., Grand Rapids, Mich., has purchased the plans, manufacturing rights, machinery and equipment of the Parradee spring auto bumper,

and has made arrangements which will result in an increase of $100,000 in the business. The inventor, Edward Parradee, will be construction superintendent.

The Haskelite Mfg. Co., Grand Rapids, now doing work for the Government, has taken option leases on 97 acres of land adjoining its 12-acre factory site, for development of the airplane as a commercial proposition after the war. It will be used as an aviation testing field.

The Stork Motor Works and the Wolverine Machine Works, both of Saginaw, Mich., have been merged into a new company, known as the Stork Motor Co., capitalized at $75,000. The plant will be located in the building now occupied by the Stork Motor Works. Of the total capitalization, $50,000 has been subscribed and paid in. The incorporators are Fred. W. Stork, John A. Anderson, C. A. Pennell and G. W. Morley.

The W. H. White Co.'s mill No. 1, at Boyne City, Mich., burned Friday night with a reported loss of $300,000. Forest fires are raging in the north central part of Michigan and threatening numerous small towns. Several lumber camps have already been burned, including those of the Ross & Wentworth Lumber Co. in Antrim County, and the Antrim Iron Co.

Cleveland

CLEVELAND, July 2.

The demand for machine tools in single machines and small lots continues very active. At present the greatest call is for universal milling machines, planers and vertical boring machines. The scarcity of milling machines is more acute than probably at any previous time, and dealers are unable to pick up second-hand machines except at very high prices. In some cases owners are asking slightly above present list prices for second-hand milling machines. Dealers generally are unable to replenish their stocks because of the heavy requirements of the Government upon manufacturers, and industrial plants are finding it difficult to get almost any kind of machinery unless they have priority certificates.

No new round-lot inquiries for machine tools for Government work have come out, but heavy buying is expected with the fiscal year starting this month. It is stated that the Government arsenals will need a great deal of new machinery and new orders to be placed by the Government will probably require a large amount of additional equipment. The American Brake Shoe & Foundry Co. is inquiring for screw machines for making adapters for 12-in. guns, these machines to be installed in a Detroit plant. The American International Shipbuilding Corporation and the Ralston Steel Car Co., Columbus, Ohio, are each inquiring for 12 punching and shearing machines. The New York Central Railroad has commenced to place orders against its list of about 175 machines issued a few weeks ago.

The Government is coming into the market for crane equipment for use in France next year. Several inquiries have come out for round lots of locomotive cranes for next year's delivery in France and crane builders expect that Government business will keep their plants busy the entire winter. Present orders on their books will not be completed until well along in the fall.

The Cleveland Punch & Shear Works Co. has taken an order from the Bethlehem Shipbuilding Corporation for 12 punching machines for its Alameda, Cal., plant, 3 standard punching and shearing machines for the Central Railroad of New Jersey and a large rotary planer for the Valley Mold & Iron Co., Sharpsville, Pa.

The U. S. Tool Co., Cleveland, maker of structural ironworkers', shipbuilders' and other small tools, has increased its capital stock from $100,000 to $200,000. An additional factory building is being planned and new machinery equipment will be required.

The Vichek Tool Co., Cleveland, is planning the erection of a new forge shop. Hammers and other equipment will probably be required.

The Eclipse Stove Co., Mansfield, Ohio, will erect a one-story brick and steel building, 80 x 400 ft. Ernest McGeorge, Leader-News Building, Cleveland, is the architect.

The New York Central Railroad has placed contracts for a one-story building, 97 x 263 ft., for locomotive repair work at its Collinwood shops.

The Cleveland Power Transmission Co., Cleveland, composed of E. S. Lenarz and B. D. Selby, has purchased from the receivers the plant of the Welsmore Mfg. Co., Detroit, and will continue the making of reamers, cutters, etc.

The National Carbon Co., Cleveland, has placed a contract for the erection of a factory building at Clarksburg, W. Va.

The American Clay Machinery Co. has just placed its No. 2 foundry, at Bucyrus, Ohio, in operation. This is a gray-iron and steel foundry, its equipment including three 4-ton cupolas and two 2-ton convertors. The plant has been started on gray-iron castings, but will be ready for making steel in a few weeks. The plant when fully completed will occupy a building 100 x 700 ft.

The Modern Glass Co., Toledo, Ohio, will build a large plant for the manufacture of caskets, bath tubs, bathroom fixtures and other glass products. H. B. Van Sickle is president and F. A. Vickery is secretary.

The Falls Rivet Co., Kent, Ohio, is preparing plans for the erection of another building.

Cincinnati

CINCINNATI, July 1.

The question of employing female labor is under serious consideration by a number of local machine tool manufacturers. A few firms have already tried out the experiment in a small measure and plans are under way to greatly increase the number of female operatives. The Lodge & Shipley Machine Tool Co. is probably the first firm to make definite plans to employ a large number of women and the arrangement of its new shop addition, that will be completed before the summer is over, was especially made to transfer its light machine work to this department, which will be done almost exclusively by women.

There does not seem to be any let-up in the call for portable electric drilling and grinding machines. The domestic demand is very heavy, but foreign sales are now practically confined to machines to be shipped to Italy. Machine-tool dealers, or brokers, are not having easy sailing as far as heavy machines are concerned, as Government requirements have to be taken care of first. As the demand for large machines is very insistent, some of them are practically forced to confine their efforts to the sale of the smaller machine tools that are not needed in war work. No advances have yet been made by machine-tool makers due to the increased freight rates.

The Peerless Foundry Co., Elmwood Place, outside Cincinnati, has been incorporated with $200,000 capital stock by George F. Dana and others. It recently commenced the operation of a foundry for light castings. Its plant at Hamilton, Ohio, was destroyed by fire about five months ago.

The Frisbie Engine & Machine Works Co., Cincinnati, will probably add equipment to its plant that is principally devoted to building and repairing of steamboat engines. W. B. George, formerly connected with the I. & E. Greenwald Co., has purchased an interest in the Frisbie company.

The Cincinnati Iron & Steel Co., Cincinnati, has commissioned Architect Harry Hake to prepare plans for two additions to its plant at Fifth Street and Freeman Avenue. James I. Stephenson is president.

It is reported, but not confirmed, that the G. A. Schaacht Motor Co., Cincinnati, is making arrangements to remove its plant to the former factory of the R. K. LeBlond Machine Tool Co. in Linwood.

Plans have been completed for a welfare building to be erected for the employees of the Lunkenheimer Co., Cincinnati. The proposed structure will be 50 x 75 ft. of brick construction.

The Ansonia Copper & Brass Works Co., Cincinnati, has leased a three-story building at 1523 West Sixth Street. It is reported it will be fitted up with machinery for making special equipment required in the construction of the Government's air nitrate plant in a Cincinnati suburb.

The Hill-Bruener Foundry Supply Co., Cincinnati, will make some important additions to its plant in West End. A boiler house will be one of the additions.

The Pfau Mfg. Co., Norwood, Ohio, maker of plumbing supplies, will erect an addition, 48 x 240 ft., of fireproof construction. Some woodworking equipment may be required later.

The Air Nitrates Co., 360 Madison Avenue, New York, which company is to have charge of the erection of a nitrate plant near Cincinnati, has opened offices in the First National Bank Building.

The Hamilton Brass & Aluminum Castings Co., Hamilton, Ohio, has been incorporated with $15,000 capital stock by Harry J. Koehler, Jr., and others.

It is currently reported that the Ohio Steel Castings Co., Springfield, Ohio, will make some further extensions of its plant.

The addition to the plant of the Atlas Brass Foundry Co., Columbus, Ohio, has been completed and practically all of the necessary equipment installed.

Indianapolis

INDIANAPOLIS, July 1.

The Ahlgren Light & Storage Battery Co., Terre Haute, Ind., has been incorporated with $25,000 capital stock to manufacture batteries and lighting systems. The directors are William T. Kincaid, Reilly C. Adams and H. C. Austill.

The W. H. Haas Mfg. Co., Raub, Ind., has been incorporated with $50,000 capital stock by William H. Haas, Talbert McAlevander and Clem Browne to manufacture machinery.

The Interstate Automobile Co., Muncie, Ind., has suspended the manufacture of pleasure cars and is now on Government work, making engines and caterpillar tractors.

St. Louis

ST. LOUIS, July 1.

The north wing of the plant of the Medart Patent Pulley Co., St. Louis, was burned last week with a loss of $100,000. It was operating on Government work and will be re-equipped.

The Tulsa Aircraft Co., Tulsa, Okla., Ray H. Pearson, manager, will equip a plant for the manufacture of airplanes for the Government.

The Fretwell Coal Co., Henryetta, Okla., has increased its capital stock by $50,000 to increase its capacity.

The Stephens Gin Co., Stephens, Ark., will equip a gin with four 80-saw stands.

W. C. Conner, Hobart, Okla., will equip an oil refinery at Duncan, Okla., with a capacity of 2000 bbl. daily.

The Magnolia Petroleum Co., Galveston, Tex., will equip four additional units in its casing-head gasoline plant at Ringling, Okla.

The Southern Light & Power Co., Corning, Ark., will install two ice-making plants, one with 280 and one with 480 cans' capacity raw water equipment.

The Vernon Paris Lumber Co., Kurthwood, La., has been incorporated with a capital stock of $500,000 by J. H. Kurth, Jr., and others and will establish a sawmill with steam plant for power. It will also establish a town and install public utilities.

The American Hinge Co., Muskogee, Okla., will equip a plant for the manufacture of a new design of hinge. J. T. Nichols is president.

Texas

AUSTIN, June 29.

The machine shop of the Texas & Pacific Railway at Marshall was destroyed by fire June 9 with a loss, including 49 machine tools and damage to 24 others, which totaled about $300,000. The arrangements for rebuilding are under way and orders are being placed for new equipment. A. P. Prendergast, Dallas, is mechanical superintendent.

The Kilgore Electric Light & Power Co. will rebuild its plant at Kilgore, which was recently destroyed by fire.

The Brownwood Glass Mfg. Co. will construct a plant at Brownwood to cost about $100,000 and give employment to 150 men. Henry Agner of Tulsa, Okla, is president.

The San Juan Planing Mill Co. will construct a plant at San Juan for the manufacture of sashes, doors and other lumber products.

The Liberty Refining Co. has purchased a site at Cisco on which it will construct an oil refinery of 1000-bbl. daily capacity.

O. B. Colquitt, Dallas, and associates, will build an oil refinery at Eastland with a daily capacity of 2000 bbl.

The Texas Star Oil & Refining Co. has been incorporated at Dallas for the purpose of constructing an oil refinery at some point in central western Texas. It has a capital stock of $2,000,000. J. M. Alderdice, Waxahachie, is president.

California

LOS ANGELES, June 26.

The California Shipbuilding Corporation, Los Angeles, has received permission from the city council to erect a shipbuilding plant at Los Angeles Harbor. A lease covering about 60 acres of property has been approved. It is said that the company will expend $200,000 for the initial works.

The Union High School, Fillmore, Cal., will establish a machine shop and forge works for its manual training department, 32 x 110 ft. Homer W. Glidden, Wright & Callender Building, Los Angeles, is the architect.

The Sierra & San Francisco Power Co., Modesto, Cal., is planning for a new electric power plant on the Stanislaus River.

The Industrial Steel & Pipe Corporation, Los Angeles, has been incorporated with a capital of $75,000 by E. P. Nugent, J. H. Pendleton, F. W. Holbrook and Samuel Jay, to manufacture pipe, etc.

The Adams Pipe Works, 2025 Bay Street, Los Angeles, will build a one-story addition, 90 x 175 ft., to cost $10,000.

A hydroelectric power plant to be erected on Snow Creek, Riverside County, is planned by Marcus Pluth, 111 West Ninetieth Street, Los Angeles, and associates, for the operation of Portland cement works to be established by them on the Whitewater River, and for local service in Riverside Country. The cement plant is estimated to cost over $500,000.

The Midway Welding Shop, 314 West Tenth Street, Los Angeles, has filed notice of organization. H. Kimber, 943 Santee Street, heads the company.

The board of education, Gardena, Cal., will build a one-story machine shop at the high school, for manual training, etc.

The U. S. Electrical Mfg. Co., Los Angeles, has leased a building, 100 x 300 ft., at Third Street and Central Avenue, for added capacity in the manufacture of motor-driven grinder equipment for shipyard service, and other apparatus. Alterations will cost about $10,000.

The Union High School, Compton, Cal., will build a machine shop for manual training work.

The Golden Welding Works, Los Angeles, has filed a notice of organization to operate a plant at 114 West Pico Street. Jacob H. Klassen, 126 East Fifty-fifth Street, heads the company.

The Pacific Northwest

SEATTLE, June 27.

The J. H. Price Shipbuilding Corporation, organized by J. H. Price, San Francisco, and associates, recently purchased from the trustees the wooden shipbuilding plant of the Sandstrom Shipbuilding Co., including its contracts. It is equipped with six ways. Crane and derrick equipment will be installed. The company holds contracts for two 2500-ton and four 3000-ton motor ships. J. L. McLean will be general manager.

The U. S. Government has awarded contract to Seims-Carey-H. S. Kerbaugh, Minneapolis, Minn., Seattle office at 216 James Street, for the construction of a 40-mile standard-gage railroad into the heart of the Olympic Peninsula, near Port Angeles, Wash., where the greatest supply of spruce timber on the Continent is located. When the railroad is finished, the Government plans the establishment of what it is claimed will be the largest sawmill in the world, at Lake Pleasant, Clallam County. It is stated that it will have 24-hr. capacity of 1,250,000 ft. of airplane spruce. Contractors are working under direction of the U. S. Signal Corps, Spruce Division. The railroad will cost, including rails and equipment, about $50,000 a mile. It is planned to employ at least 5000 men in rushing the work of construction.

The Seattle Pipe Galvanizing Co., Seattle, plans the construction of workshops to cost $6,000.

Plans for Acme Forge Works' foundry at Spokane Street and East Marginal Way, Seattle, have been completed, and bids will be called.

Yarrows, Ltd., Esquimalt, B. C., plans the extension of its foundry and the installation of additional equipment.

The Todd Dry Docks, Inc., Seattle, recently filed articles of incorporation with a capital stock of $1,000,000. It succeeds the former Seattle Construction & Dry Dock Co. The work of doubling the capacity of the Todd steel shipbuilding plant in Tacoma is progressing rapidly, and eight ways will be in operation by Sept. 1. The force will shortly be increased to 10,000 men. It is stated that the foundry and machine shop under construction will cost $200,000.

The Vulcan Mfg. Co., Seattle, has awarded contracts for installing chainways in its storage building and converting it into a machine shop. The machine shop planned will cost $10,000.

Contracts have been awarded by Gulowsen-Grel Engine Co., Seattle, for three buildings of its proposed plant.

The power plant of C. A. Cotgrell at Washougal, Wash., was totally destroyed by fire with loss of $25,000.

The American Tugboat Co., Everett, Wash., plans the construction of a machine shop, blacksmith shop and pattern works to replace the small machine shop it now operates.

The boiler room of the Hoquiam Sash & Door Co., Montesano, Wash., was destroyed by fire recently with a loss of about $15,000.

P. J. Appleton, 1111 First Avenue, Seattle, will construct

a foundry and machine shop at 1410 Dearborn Street., two stories, 43 x 114 ft., to cost $6,000, exclusive of equipment.

The Refrigerator Car Equipment Co., Spokane, plans establishment of a manufacturing plant in that city, which will employ 100 men.

It is announced that financial arrangements have been completed for the establishment in Everett, Wash., of the Labert Tire Co.'s proposed automobile tire manufacturing plant.

The Paragon Tool Co., 411 Occidental Avenue, Seattle, has recently completed a plant for the manufacture of steel tools used in shipyard work. John A. Graham is president and M. R. Helmer, vice-president.

The Astoria Marine Iron Works, Astoria, Ore., has entered into contract with the Emergency Fleet Corporation to cast propellers for the ships now being constructed in lower Columbia River yards.

The Columbia River Shipbuilding Co., Portland, which was awarded contracts for ships costing $25,000,000, plans extensive improvements. The present three ways will be increased to five and several buildings will be erected for blacksmith and machine shops.

Twohy Bros., Portland, are enlarging their car manufacturing plant at Montavilla, Ore., to accommodate Government orders for freight cars. Approximately $150,000 will be expended.

The Refrigerating Car Equipment Co., Spokane, will build a manufacturing plant at Hillyard or Spokane to carry out contracts for the Great Northern Railroad and probably for the Government.

L. J. Simpson, Portland, announces that, with associates, he will build a shipyard and sawmill in Portland and take over 30,000 acres of timberland on Smith River. It is stated that $500,000 will be invested.

Following the consolidation with the Skinner & Eddy Corporation, Seattle, of the Seattle Construction & Dry Dock Co., considerable new machinery is being installed. Foundations have been started for a plate and bending shed, 82 x 260 ft., and work will soon begin on a 150 x 600-ft. foundry and machine shop adjoining the one now under construction.

The school board, Salem, Ore., is advertising for several lathes, a drill press and other material and equipment for the technical school.

The Western Ship Supply Co., Portland, has been incorporated with a capital stock of $10,000 by Conrad P. Olson, Ben S. Hill and Frank Gates.

Joseph R. Bowles, president of the Northwest Steel Co., Portland, and others are formulating plans for the erection of a new steel shipbuilding plant to be erected in South Portland near the site of the Coast Shipbuilding Co.'s plant.

Improvements, including additional machinery, will be made at the Puget Sound Navy Yard, Bremerton, Wash., to the amount of $325,000.

The Port of Portland, Portland, is in the market for an electric generator set, fittings, etc.

Canada

TORONTO, June 29.

Canada is to manufacture automatic revolvers for the United States Army. Originally the business was offered to the Russell Motor Car Co. of Toronto, but as the order was extensive and the latter busily engaged on other war work, it has been found necessary to organize a new company for the purpose. The new concern, in which Russell interests are prominent, will be known as the North American Arms Co., Ltd., capitalized at $2,000,000. It will occupy the old Ross rifle plant a Quebec, owned by the Dominion Government, but largely unused for the past two years. Although some machinery has been disposed of, there is still sufficient on hand to form the nucleus of a substantial plant. It will be two or three months, however, before it will be in active operation. The president of the new company is T. A. Russell of Toronto; vice-president, H. C. Cully, who will shortly take up his residence in Quebec. The general manager will be Thomas Craig, formerly manager of the Ross Rifle Co. In addition to Mr. Craig, the new company will also have at its command a goodly portion of the old Ross rifle organization, which fortunately has been retained by the Government during the process of liquidation, which has been going on during the last two years under the management of W. S. Fisher, St. John, Que.

The Canadian Northern Railway Co. is tearing down the old 10-stall roundhouse at Rainy River, Ont., which will be replaced by a new 10-stall brick building. A new 82½-ft. air-driven turntable will be installed, also a sand-drying house and car repair shops.

Canadian Hoskins, Ltd., Walkerville, Ont., manufacturer of electric furnaces and pyrometers, are erecting a concrete and steel factory building on Walker Road, which will be completed in about three months. It is ell-shaped, 60 x 170 x 220 ft., and will give the company added facilities for the production not only of pyrometers and furnaces, but also of nickle chrome castings and wire.

The Dillon Crucible Alloys, Ltd., Welland, Ont., are in the market for alligator or guillotine shears, capacity up to 3-in. square steel.

The executive of the Halifax Shipyards, Ltd., is announced as follows: Chairman of the board, James Carruthers; president, J. W. Norcross; vice-president and managing director, Roy M. Wolvin; vice-president, M. J. Haney; treasurer, F. S. Isard, all of Montreal. Messrs. Carruthers, Norcross and Wolvin have returned from Halifax, N. S., where they spent a few days completing plans with the engineers for the commencement of work on the new plant. Adequate arrangements for producing the steel plates have been made. Some 3500 men will be required. The company is now receiving bids in connection with the rebuilding.

A new industry just established in Montreal is the manufacture of the simplex electric wood planer, by the Simplex Floor Finishing Appliance Co. Eight of them, varying in length from 150 to 300 ft., have been supplied to the Canadian Vickers, Ltd.

The Albian Machine Co., Ltd., New Glasgow, N. S., is in the market for one scleroscope and one Gurney testing machine.

J. L. Nelson & Co., Winnipeg, Man., is in the market for a frog and switch planer with 2 heads on cross-rail and about 15-ft. bed.

The William Lyall Shipbuilding Co., North Vancouver, B. C., will erect an addition to its shipbuilding berths. E. D. Cook is manager.

The British Columbia Box Co., 295 Dufferin Street West, Point Grey, B. C., will build a sawmill on the Fraser River to cost about $100,000. Thomas Harvil, 1001 Burrard Street, is manager.

The Miami Corporation, Haney, B. C., propose to build a lumber mill at Port Haney, B. C., to cost $80,000. Abernethy & Lougheed, Port Haney, are local representatives.

The British Forgings, Ltd., Atlantic Avenue, Toronto, Ont., have commenced the erection of a munitious building to cost $6,000.

The Verity Plow Co., Ltd., Brantford, Ont., will build an addition to its plant to cost $30,000. W. G. Ranton is secretary-treasurer.

The Cockshutt Plow Co., Ltd., Brantford, Ont., will build a one-story brick addition to its boiler house to cost $10,000.

The Dominion Copper Products Co., Ltd., Lachine, Que., is building a machine shop to cost $22,000.

The Universal Tool Steel Co., Ltd., 159 Dufferin Street, Toronto, has awarded contracts in connection with the building of a factory addition to cost $45,000.

N. Brenner & Co., Ltd., Toronto, has been incorporated with a capital stock of $50,000 by Nathan Brenner, 11 Hagerman Street, Henry H. Shaver, Myer Brenner and others, to manufacture steel, machinery, etc.

The W. E. Irons & Co., Ltd., Toronto, has been incorporated with a capital stock of $25,000, by Walter E. Irons, 32 Temperance Street, Gordon A. Ronan, Stanley J. Palmer and others to manufacture steel stamps, brass dies, stencils, etc.

The Dominion Sheet Metal Corporation, Ltd., Hamilton, Ont., has been incorporated with a capital stock of $500,000 by John R. Marshall, Henry A. Burbidge, Arthur B. Turner and others to manufacture iron, steel sheet, tin, etc.

Government Purchases

WASHINGTON, July 1.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, as follows: Schedule 4777½, for Washington, 6 screw machines, opening July 8; 4778½, for Washington, 56 screw-cutting lathes, opening July 8; 4784½, for Washington, hobbing machines, opening July 8; 4785½, For Washington, 10 arbor presses, opening July 8; 4786½, for Philadelphia, tool grinder, opening July 8; 4805½, f.o.b. works, 58 salvage pumps, opening July 8.

Sealed bids will be opened Aug. 12, under specification 3038, for power plant extensions and improvement at Pearl Harbor, T. H., estimated to cost $150,000; until July 15, specification 3114, for coal and ash-handling equipment for the Government aircraft factory boiler plant at Philadelphia, estimated to cost $40,000.